1991

An assessment and analysis of agricultural extension education programs in Peru: implications for development

Rebecca Brown Mejia
Iowa State University

INFORMATION TO USERS

This manuscript has been reproduced from the microfilm master. UMI films the text directly from the original or copy submitted. Thus, some thesis and dissertation copies are in typewriter face, while others may be from any type of compute. printer.

The quality of this reproduction is dependent upon the quality of the copy submitted. Broken or indistinct print, colored or poor quality illustrations and photographs, print bleedthrough, substandard margins, and improper alignment can adversely affect reproduction.

In the unlikely event that the author did not send UMI a complete manuscript and there are missing pages, these will be noted. Also, if unauthorized copyright material had to be removed, a note will indicate the deletion.

Oversize materials (e.g., maps, drawings, charts) are reproduced by sectioning the original, beginning at the upper left-hand corner and continuing from left to right in equal sections with small overlaps. Each original is also photographed in one exposure and is included in reduced form at the back of the book.

Photographs included in the original manuscript have been reproduced xerographically in this copy. Higher quality 6" x 9" black and white photographic prints are available for any photographs or illustrations appearing in this copy for an additional charge. Contact UMI directly to order.

UMI

University Microfilms International
A Bell & Howell Information Company
300 North Zeeb Road, Ann Arbor, MI 48106-1346 USA
313/761-4700 800/521-0600

Order Number 9212168

An assessment and analysis of agricultural extension education programs in Peru: Implications for development

Mejia, Rebecca Brown, Ph.D.

Iowa State University, 1991

U·M·I
300 N. Zeeb Rd.
Ann Arbor, MI 48106

An assessment and analysis of agricultural extension education programs in Peru: Implications for development

by

Rebecca Brown Mejia

A Dissertation Submitted to the
Graduate Faculty in Partial Fulfillment of the
Requirements for the Degree of
DOCTOR OF PHILOSOPHY

Department: Agricultural Education and Studies
Major: Agricultural Education

Approved:

Signature was redacted for privacy.

In Charge of Major Work

Signature was redacted for privacy.

For the Major Department

Signature was redacted for privacy.

For the Graduate College

Iowa State University
Ames, Iowa

1991

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

CHAPTER I. INTRODUCTION

Peru, the third largest country in South America, is bordered by Ecuador and Columbia to the North, Brazil and Bolivia to the East, Chile to the South and the Pacific Ocean to the West. Possessing over 1,400 miles of coastline, Peru is divided into twenty-four states (*departamentos*) and one province. Peru covers almost one half million square miles, approximately equivalent to the combined area of the midwestern states of Minnesota, Wisconsin, Iowa, Missouri, Illinois, Indiana and Ohio (Schmidt, 1984; The Countries of the World and their Leaders Yearbook, 1991).

Peru is a physically diverse country with three different topographical and climatic zones. The nation's largest waterway, the Amazon River, enters into Northeastern Peru from Brazil and has many tributaries which extend throughout a large portion of the country. The Andes Mountain range crosses from Southeastern to Northwestern Peru, paralleling the coast. The Andes are comprised of two mountain ranges which divide the country into the following three natural regions:

1. The Pacific Coastal Region: The *costa*, which is 3,080 kilometers (km.) long, accounts for roughly 10% of Peruvian territory. The coastal region varies greatly in width, ranging from over 100 km. in the northern state of Piura to less than 1 km. in the southern state of Arequipa. This long, narrow strip of land is largely arid with the exception of the area north of Piura. The climate is similar

throughout the coastal region largely due to the effects of the offshore current, known as "El Niño", and the Andes Mountains. Rainfall is scarce on the coast. The country's major urban centers are located in this region and are dependent upon water flowing down from the mountains. The capital city of Lima, located on the central coast, receives an average of only two inches of rain per year.

2. The Andean Highlands Region: The *Sierra*, which is approximately 200 miles wide, consists of roughly 25% of the territory of Peru. The average height of the Andes mountains is 4,000 meters above sea level, with the highest peak reaching an altitude of 6,729 meters. The Andes form a barrier that divides the country in half, severely limiting transportation and communication. Below the Andean peaks lie areas of gently sloping, fertile land. In the Southern Sierra, Lake Titicaca, the highest navigable body of water in the world, is surrounded by a high plateau or *altiplano* which reaches 12,500 feet above sea level. The temperature in the highlands depend greatly on elevation and may be severe. Rainfall varies by latitude, longitude and season, ranging from drought conditions to torrential rainfalls which may devastate entire villages and cause extensive soil erosion.
3. The Amazon Region: The *Selva* (jungle), accounts for more than one half of the land in Peru and has many waterways, including the Amazon river to the North. Rainfall in the Peruvian jungle averages over 100 inches per year. This large geographic region is

divided into three subregions. The *Ceja de Selva* or "brow of the mountain", has a temperate climate and severe topography. The "High Selva" lies in the uppermost portion of the Andes and is characterized by long, narrow gorges carved by the many rivers and fertile riverbed land. The "low Selva", which is found at the foot of the Andes, has extensive forests and is often affected by flooding stemming from the mountains above (Schmidt, 1984; Paz Silva, 1986; World Almanac and Book of Facts 1990; The Countries of the World and Their Leaders Yearbook, 1991).

Need for the Study

Over the past decades, there has been a decline in the performance of the Peruvian agricultural sector. With a national population growth rate of 2.5% (World Almanac and Book of Facts, 1990), this phenomenon has resulted in a declining ratio of food produced per capita. This situation, which has been exacerbated by the increasing rate of migration to urban areas, has encouraged national dependency on food imports. A growing population combined with the declining levels of agricultural production has resulted in increased food imports of over 20% between the early 1970's and 1980 (INIAA, 1985). The decline in agricultural production has had a direct influence on the decreasing standard of living among the majority of Peruvians and the increasing level of malnutrition and social unrest (Morales Bermudez, 1987).

The productivity of the land under cultivation in Peru is low due to a variety of factors which include the level of technology employed and the lack of agricultural inputs. In many cases this is due to the fact that technology and inputs are either not available to the producers or are simply not affordable (Pomareda Benel, 1985; ISNAR, 1985). The most recent comprehensive study of the rural sector of Peru, the National Survey of Rural Homes (ENAHR), conducted between August 1983 and July 1984, concluded that nationally, only 3.6% of the agricultural producers received agricultural extension services during this period. The receipt of such services in one year, either individually or in groups, was defined as follows: three contacts between producer and extension agent for one crop; five contacts for producers with a two or more different kinds of crops; two contacts for producers with one species of livestock or three contacts for producers with two or more different species (Ccama, 1987).

The availability of agricultural credit is an important variable in the effort to increase agricultural production. Agricultural extension agents may provide the main source of information regarding access to credit in Peru as the majority of producers live in rural areas, often having no interaction with banking institutions. The ENAHR determined that only 7.5% of agricultural producers in Peru received agricultural credit from formal institutions. This figure is highly unequal when the geographic destination of credit is considered. While 31.5% of the agricultural production units in the Coastal

region received formal credit, the same may be said of only 3.5% in the Sierra and 8.5% in the Sierra (Ccama, 1987).

The receipt of extension services and agricultural credit is vital to increasing the level of agricultural production in Peru. The ENAHR study revealed the following: nationally, agricultural production units which did not have access to either credit or agricultural extension services earned an average of 750 intis (July 1984 intis) for each hectare under cultivation; producers which had access to both agricultural credit and extension earned an average of 1,386 intis for each hectare under cultivation (Ccama, 1987). A ISNAR report prepared for the Peruvian Ministry of Agriculture in 1985 stated:

> Agricultural development, in terms of improved quality of life for Peru's poorer farmers and herders; in terms of greater productivity by the majority of producers, traders, and processors; and in terms of improved food availability for the majority of Peru's poor, will therefore be a major measure of the success of Peru's public and private sector institutions over the next several years. That development will depend on several factors; an important one will be continued and even greater support for technology generation (ISNAR, 1985, p. 2).

Agricultural extension services, the primary source of information on new technology for farmers, plays an integral part in the development of the agricultural sector in Peru. A review of the literature revealed that the majority of the agricultural research undertaken in recent years has focused on specific research objectives such as the improvement of potato varieties for the producers in the Andes mountains, or the exploration of alternative

irrigation practices for the dry coastal valleys. There is a great deal of literature regarding the deterioration of the Peruvian economy, the growing number of people entering the informal employment sector, the increasing levels of urban migration as well as a large amount information on the agrarian reform. There is also a substantial amount of anthropological case-study research of rural agricultural villages in the Andes and the jungle regions. Literature regarding agricultural extension primarily consists of governmental or international consultant reports aimed at improving the extension programs of the Ministry of Agriculture. These reports do not take into consideration the private research and education institutions or international aid agencies which promote agricultural development programs in Peru. The literature review yielded no recent comprehensive studies of the agricultural extension system.

Although increasing agricultural productivity has been a major objective of Peruvian governments for decades, research into agricultural extension in Peru is limited (INIAA, 1985). Questions regarding the process by which information and technology are disseminated, the role of agricultural extension agents and the perceived needs of farmers must be addressed in order to improve the contribution of extension to increased agricultural production. An ISNAR analysis of the Peruvian agricultural extension system stated increased agricultural productivity "...cannot come from increasing the cultivated area, but will have to come from increased productivity" (ISNAR, 1985, p. 2). An independent report to the Peruvian agricultural

research institution, INIAA, supports further research into agricultural extension by concluding that in order to increase agricultural production, it is necessary to improve the existing agricultural information dissemination system (Nuñez Nuñez, 1988).

Purpose and Objectives of the Study

The main purposes of this study were to develop a comprehensive profile of the institutions which promote agricultural development in the South American country of Peru and to provide baseline data on the status of the agricultural extension system as a foundation for future related research. A secondary purpose of this study was to determine the needs and limitations of the agricultural extension system as perceived by individuals who were directly involved in promoting the development of the agricultural sector in Peru.

The specific objectives of the study were as follows:

1. To develop a comprehensive profile of organizations that are involved in promoting agricultural extension in Peru.
2. To determine the role of agricultural extension education and the role of agricultural extension agents as perceived by individuals who are defined as agricultural development promoters.
3. To determine the limitations of agricultural extension education and agricultural extension agents as perceived by agricultural development promoters.

4. To identify the most important limitations and challenges that face agricultural production in Peru as perceived by agricultural development promoters.
5. To compare perceptions of agricultural development promoters with selected demographic data.
6. To compare selected perceptions among agricultural development promoters who are employed in the public, private and international sectors.

Research Questions

The following research questions were addressed in this study based upon the perceptions of the those individuals who were directly involved in promoting the development of the agricultural sector in Peru.

1. To what extent are agricultural extension services provided to producers by unit of production?
2. To what extent should producers receive agricultural extension services by unit of production?
3. What are the primary limitations to organizations that promote agricultural development?
4. What is the perceived role of agricultural extension agents?
5. What are the primary limitations of agricultural extension agents in conducting their work?
6. To what extent does coordination exist among agricultural

development promoters?

7. Who should bear the cost of agricultural extension services?
8. What are the most important challenges facing agricultural production in Peru?
9. What is the descriptive profile of organizations which promote agricultural development in Peru?

Implications and Educational Significance

Extension education has the potential to contribute significantly to an increase in agricultural production (Hurtado Miller, 1986). Understanding the organizational structure as well as the administrative and service activities of the agricultural extension education system in any country is a vital step towards determining a national agricultural policy. This is especially true if the country in question, like Peru, has an agrarian-based economy but is not able to supply sufficient food for its population. Baseline research, such as that which has been conducted in this study, is necessary before informed changes in agricultural policies may be undertaken by both national governmental officials and those members of the international aid community which promote agricultural development.

By assessing agricultural extension education systems in different countries around the world, knowledge is gained through which comparisons, evaluations and subsequent changes may be made. Rivera, Seepersad and Pletsch (1989), state the educational implications of studying

international extension systems are as follows:

> It is our view that international and comparative study of agricultural Extension provides intellectual insight and the basis for practical action. One of the ways it does this is by helping us to understand the desires of key officials in other extension systems. According to Dogan & Pelassy (1984), comparison helps us to "escape from ethnocentrism" and therefore it may be a powerful lever for change (Rivera, Seepersad and Pletsch, 1989, p. 139).

When considering the purposes of this study, to develop a comprehensive profile of the agricultural extension system in Peru and to determine the perceptions of development promoters who, by definition, include the above mentioned key officials, the educational implications are clear. The determination of limitations to organizations which promote agricultural development and the assessment of the extension needs of producers in Peru will provide a basis for strategic planning and change. Defining the perceived role and limitations of agricultural extension agents will provide a foundation by which education programs for extension agents may be improved. Determining the perceived most important challenges to agricultural production in Peru will provide information on which extension education programs may be modified and increased attention focused on critical issues. The findings of the study may be incorporated into both formal and non-formal educational programs. This study provides not only the basis for practical action by policy makers and educators, but also intellectual insight and the basis for further research.

Operational Definitions

For the purposes of this study, the following terms were defined:

Agricultural Development: the improvement of the agricultural sector by equitably increasing: agricultural productivity; income generated from production; marketing and transportation opportunities; access to agricultural extension services, appropriate technology and information; access to adequate credit and inputs.

Agricultural Development Promoters: Those individuals who work with institutions (i.e. the Ministry of Agriculture, agrarian universities, international development agencies, private research and extension organizations) which have the development of the Peruvian agricultural sector, either directly or indirectly, as a primary operational goal.

Agricultural Extension: extension education to improve agricultural production and to advance community and rural development based upon the needs of the clients (Rivera, Seepersad and Pletsch, 1989).

Agricultural Producers: those individuals directly involved in on-farm agricultural production activities and for whom this activity is their primary source of income.

Appropriate Technology: "A technology designed, developed, or chosen in conjunction with local users to increase their productivity and meet their immediate and longer term needs, without significantly increasing their dependence on outside sources of materials, energy, funds and knowledge. A technology that will work; that local inhabitants

or organizations can afford and continue to maintain and improve" (Mitchell, 1980, cited in Berardi, 1985).

Campesino: Spanish word for rural agricultural worker.

CAP: Agrarian Production Cooperative. Communally owned and operated agricultural lands which share resulting profits (Cleaves and Scurrah, 1980).

Development: "a multidimensional process involving major changes in social structures, popular attitudes and national institutions as well as the acceleration of economic growth, the reduction of inequality and the eradication of absolute poverty" (Todaro, 1977, p. 62).

ENAHR: Encuesta Nacional de Hogares Rurales or National Survey of Rural Homes. A nation-wide survey undertaken by the Peruvian Ministry of Agriculture with USAID funding during the period of August 1983 to July 1984.

Extension: "Extension is a system of nonformal education. As such, it is a field of professional education practice aimed at: 1. teaching people, in their own context and life situations, how to identify and assess their own needs and problems; 2. helping then acquire the knowledge and skills required to cope effectively with those needs and problems; 3. inspiring them to action" (Boone, 1989 p. 1)

Formal Credit: refers to credit which is obtained directly from an established private or national banking institution.

Informal Credit: refers to credit which is obtained from sources other than established private or national banking institutions. These may include local private business selling product on credit, local lenders or family loans.

ISNAR: the International Service for National Agricultural Research. Established in 1980, ISNAR, based in the Netherlands, is one of the International Agricultural Research Centers.

INIAA: the National Institute of Agricultural Research of the Peruvian government.

Land Reform: "...is the process by which agricultural lands are distributed among new owners or redistributed, i.e., taken away from their old owners and given to new ones" (Astelarra, 1975, p. 11).

SAIS: Agrarian Social Interest Society. "...a joint enterprise between a servicing cooperative (formed from the workers on a previous hacienda) and nearby campesino community" (Cleaves and Scurrah, 1980, p. 220).

Summary

Agricultural extension services, often the primary source of information regarding new technologies and agricultural credit for producers, is vital to increasing agricultural productivity in Peru. Studies have shown when agricultural extension services are combined with agricultural credit, annual earnings increase from an average of 750 intis to an average of 1,386 intis per hectare for Peruvian farmers (Ccama, 1987). Peru, with a growth rate of 2.5%, will double it's population by the year 2025 (World Almanac and Book of Facts, 1990). Decreasing agricultural productivity has resulted in increased food imports of over 20% between the early 1970's and 1980 (INIAA, 1985). Malnutrition increases daily as the per capita caloric intake declines. As increased agricultural production must come through growth in productivity rather than the expansion of agricultural lands (ISNAR, 1985, p. 2), extension services will be called upon to play a vital role.

CHAPTER II. REVIEW OF THE LITERATURE

The main purposes of this study were to develop a comprehensive profile of the institutions which promote agricultural development in Peru and to provide baseline data on the status of the agricultural extension system as a foundation for future related research. A secondary purpose was to determine the perceived needs and limitations of the agricultural extension system on the part of those individuals who were directly involved in promoting the development of agriculture.

Population

As of 1988, Peru had a population of 21,792,000 with a density ratio of 43 people per square mile. In the same year, the capital city of Lima had a population of 4,330,000, roughly 25% of the national population (Statistical Yearbook for Latin American and the Caribbean, 1986). Due to the fact that Lima has continued to grow at an accelerated rate due to urban migration, this figure may be outdated. Between 1972 and 1981, the average population growth rate for Peru was estimated to be 2.5% (Castañeda, 1986). Continued population growth at this level implies a doubling of the population by the year 2025 (World Almanac and Book of Facts, 1990). Summarizing the population distribution of Peru, Castañeda concluded:

> About 51.3% of this population lives along the Coast, 39.1% in the Sierra and 9.6% in the jungle. The coastal area comprises about a ninth of the land area of Peru but is inhabited by more than half of the total population. The jungle is approximately 63% of the land area where less than 10% of the population settles (Castañeda, 1986 p. 1).

Demography dependency, defined as the population under age 15 and over age 65 as a percent of the total population, was 78.8% in 1985 (Statistical Yearbook for Latin American and the Caribbean, 1986). The national average life expectancy at birth in Peru is estimated to be 55.2 years, but varies greatly by regions as does the birth and infant mortality rates (Webb and Lamas, 1987). Table 1 indicates demographic information by regions.

Table 1. National and regional demographic statistics

Location	Birth Rate (per 1,000)	Death Rate (per 1,000)	Life Expectancy (years)
National	38.2	13.6	55.2
urban	31.9	9.8	60.6
rural	48.7	17.3	50.0
By Regions			
coast	31.0	8.9	62.0
sierra	44.6	17.1	50.2
jungle	44.9	13.3	53.8

Source: Peruvian Ministry of Health cited in Webb and Lamas, 1987. p. 63.

Peru is one of the few countries in the Americas that has two official languages: Spanish and Quechua. According to Yabar (1978) cited in Castañeda, Spanish is the primary language of the Coast. Quechua is spoken in several variations in the Sierra. In the jungle regions, more than 60 languages and dialects are spoken, all distinctly different from Quechua (Castañeda, 1986). It is estimated that 30% of the population of Peru does not speak Spanish, the language used almost exclusively for business, media and education (World Almanac and Book of Facts, 1990).

As in other Latin American countries, race is largely a question of cultural and socioeconomic factors rather than purely hereditary. Peru has a large indigenous population which accounts for 45% of the population are *mestizos* (descendants of mixed heritage) makeup 37% of the population of Peru and Caucasians 15%. In the jungles of Peru there are still tribes which live much the same way as they have for hundreds of years. The people of the Sierra are more assimilated into the mestizo-Hispanic culture that predominates in the urban coastal regions (Countries of the World and Their Leaders, 1991).

Officially, education is compulsory for ten years although compulsory education laws are seldom enforced. Often access to the minimum required education is not available, especially in rural areas and in the *pueblos jovenes* (squatter settlements), which have been established on the fringes of the major cities as a result of the urban migration (El

Comercio, March 28, 1990). The Statistical Yearbook for Latin America and the Caribbean estimates that in 1985, 73.8% of the school age population between the ages of 6 to 23 years of age attended formal educational institutions. In 1985, UNESCO estimated that 15.2% of the population of Peru over the age of 15 was considered to be illiterate (Statistical Yearbook for Latin America and the Caribbean, 1986).

The standard of living greatly differs between the rural and urban areas. In 1980, it was estimated that 69.9% of the population of Peru lived in an urban area of 20,000 or more inhabitants. In the same yar it was estimated that only 13.2% of the rural population had "easy access" to water, defined as a source of water not more than 200 meters from the dwelling unit, while 79% of the urban population had such access to water. In 1980, the occupied dwellings with electricity was estimated to included 4.2% of the rural and 54.9% of the urban homes (Statistical Yearbook for Latin America and the Caribbean, 1986).

Economic and Political Situation

Of the 5.2 million people that make-up the workforce in Peru, 38% work in agriculture, 17% in industry and 45% in government and other services. The industrial sector, which is based almost exclusively in the Lima area, is the largest contributor to the economy (Countries of the World and Their Leaders Yearbook, 1991).

After twelve years of military rule, Peru returned to a democracy in

1980. The current president, Alberto Fujimori, took office in July of 1990. The presidential term of office is five years in accordance with the Peruvian constitution of 1979 (Countries of the World and Their Leaders Yearbook, 1991).

Peru has undergone an economic and social crisis unparalleled in it's history. Inflation, unemployment, international debt and a crumbling infrastructure has resulted in massive worker strikes and shortages in supplies and services necessary to meet the basic needs of the population. Inflation within Peru has been 1,383,120% over the last five years with 2,700% between February 1989 and February 1990 (El Comercio, February 25, 1990). The Gross National Product (GNP) per capita which grew almost 90% between 1950 and the mid 1970's, had fallen by 1988 to the level of 1960 (Figueroa, 1989). It is estimated that the GNP fell 22.4% between 1988 and 1989 (The Los Angeles Times, June 19, 1990). In regards to the agricultural sector, Larios (1989) states that in the 1950's, the agricultural sector accounted for 24% of the GNP. During the 1980's, this level had fallen to 11% (Larios, 1989).

Since the mid 1970's, real income had fallen dramatically while the inequality of income distribution has increased. Figueroa (1989) estimated that real income fell by 50% in the one year period between 1987 and 1988 (Figueroa, 1989). The Los Angeles Times cites other studies which show that real income fell by 60% in 1988 and 1989. In 1984, it was estimated that 54% of the population was adequately

employed. That number is now said to be 18% with millions of people entering into the "informal" or black-market economy which makes up approximately 50% of all economic activity. One result of the increasing informal sector is that governmental tax revenues have fallen to only 4% of the GNP (The Los Angeles Times, June 19, 1990).

As in other Third World nations, much of the population of Peru live in conditions of extreme poverty. According to Altimir (1978) cited in Figueroa (1989), in 1970, 50% of the population of Peru was considered to fall into the category of "extreme poverty" as defined by the inability to acquire basic goods and services required for daily life in Peru. Figueroa states that according to more recent figures, this percentage has risen to 57% in 1986 (Figueroa, 1989). These estimates were calculated prior to the hyper-inflation and the corresponding fall in GNP and real income which Peru has experienced since 1986.

The fall in GNP per capita, the decrease in real income and a continued inflation rate have contributed to the high level of social unrest which is found in Peru. This social unrest, which is in addition to terrorist activities, is estimated by Velasco (1989) cited in Figueroa (1989) to have increased 1,000% in the cities and 3,000% in the rural areas between 1985 and the first trimester of 1988 (Figueroa, 1989). Man hours lost due to strike activity, a prime social unrest indicator, reached 34,437,100 in 1988 as compared to only 9,067 in 1987 (Fernand and Salazar, 1989).

Terrorism

There are two major terrorist groups in Peru today, the MRTA and the *Sendero Luminoso* or the Shinning Path, the later being the most active and well known. While the MRTA is primarily based in the Lima metropolitan area, the Shinning Path's main support in the rural agricultural regions of the country. The Maoist Shinning Path practices guerrilla warfare throughout the country with the primary objective being to destabilize the government (Bourque and Warren, 1989).

By 1987, 20 of the 126 Peruvian provinces had been declared under a "state of emergency" (Bourque and Warren, 1989). In the 11 years since the Shinning Path was born, it is estimated that more than 18,000 people have been killed, most of them innocent peasants. In 1989, more than 3,000 people were killed in terrorist related actions, up 62% from 1988 (The Los Angeles Times, June 19, 1990). Amnesty International claims that the government sources in Peru are using terror to fight terror and have killed 3,000 people in the last 7 years, in the same period, more than 3,000 detainees have disappeared (The Los Angeles Times, November 29, 1990).

In recent years, the Shinning Path has joined forces with the drug traffickers and the peasant growers of coca, the source of cocaine, in the agricultural regions of Peru. With Peru producing over 60% of the coca grown in the world, this has provided a lucrative source of income by which the terrorist finance their activities (The Los Angeles Times,

May 22, 1990). The wide-spread terrorist activities in the countryside combined with the sometimes indiscriminate reprisals by the governmental forces has contributed to the migration of peasants to the urban areas. The violence in the country-side has sharply hampered rural development efforts (Bourque and Warren, 1989).

Agricultural Sector

Due to the severe nature of the geographic composition of Peruvian sierra and jungle regions, it is estimated that only 2.2% of land in Peru is considered to be arable (Countries of the World and Their Leaders Yearbook, 1991). Nationally, of the 7.6 million hectares (ha.) suitable for agriculture, 3.0 to 3.5 million ha. are being utilized for intensive cropping (one hectare equals 2.49 acres). An estimated 18 million ha. are suitable for pastureland and 50 million ha. for forestry (ISNAR 1985). McClintock et. al., (1985) state that as of 1975, the amount of farm land per rural inhabitant (i.e., irrigated crop land, dry crop land and pasture) was only .47 ha., one of the highest densities in the world. Expansion of farm land is difficult as virtually the only possible location is the foothill region which lies east of the Andes. The agricultural potential of this area is uncertain (McClintock et. al., 1985). The best opportunity for increasing the amount of arable land is to expand irrigation in the dry Coastal valleys. Of the approximately 1.2 million ha. which are under irrigation in Peru, 400,000 ha. are in the

Sierra. The additional 800,000 ha. lie on the fertile coastal lands which is considered the "breadbasket" of Peru (ISNAR, 1985).

There are extreme variations in the growing conditions in the three geographic regions of Peru: the coast, the jungle and the sierra. Both agricultural products and agricultural production systems vary greatly by geographic area (Hopkins, 1987). Table 2 indicates the main crops produced in Peru by geographic regions.

Table 2. Main crops in Peru by geographic regions (*n.s: not significant)

Regions	Distribution of Production (percent)		
	Coast	Sierra	Jungle
rice	67	*n.s.	33
cotton	83	0	17
beans	42	18	40
sweet potatoes	98	1	1
corn (choclo)	55	41	4
mango	89	10	1
potatoes	4	93	1
barley	*n.s.	100	*n.s.
corn amilaceo	4	94	2
wheat	1	99	0
lima beans	0	99	*n.s.
oca	0	99	*n.s.
olluco	0	99	1
peas g.s.	1	98	1
peas g.v.	11	83	6
coffee	*n.s.	1	99
coca	0	11	89
oranges	23	6	71
corn duro	42	4	54
yucca	3	3	94
bananas	4	9	87

Source: ENAHR as cited by Hopkins, 1987.

The primary traditional agricultural export products from Peru are fishmeal, cotton, sugar and coffee (Banco Contential, 1989). In recent years, non-traditional crops such as asparagus have been promoted for export. Asparagus is being exported in fresh, frozen and preserved form with processing taking place within Peru (The Andean Report, 1990). The export patterns of traditional crops for the period from 1978 to 1988 are shown in Table 3.

Table 3. Traditional agricultural export products (thousands of metric tons)

Year	Fishmeal	Cotton	Sugar	Coffee
1978	483	18	266	54
1984	401	11	116	52
1985	508	28	64	60
1986	716	21	55	75
1987	732	9	33	70
1988	825	10	36	49

Source: Banco Contential, 1989

One of the biggest largest facing the exportation of Peruvian agricultural products to the world market is guaranteeing sufficient production to fulfill market demands. This situation is due in large part to the land ownership laws which resulted from the agrarian reform movement of the late 1960's and 1970's (The Andean Report, 1990).

Agrarian Reform

Peru underwent large scale agrarian reform beginning in 1968 when the military government under General Velasco overthrew the democratically elected government of President Belaunde. President Belaunde, elected in 1963, had promised massive agrarian reform but in actuality, little changes occurred (McClintock et. al., 1985). Kay states that prior to the agrarian reform measures, land distribution was very unequal. In 1961, 1.2% of farms held 52.3% of agricultural land while the minifundistas and peasant communities, which accounted for 84.6% of farms, held 40.8% of the land (Kay, 1982). Asitz (1969) cited in McClintock et. al., estimated that in 1961, approximately 1.4% of landowners, or 3,000 people, controlled over 62% of all agricultural lands in Peru (McClintock et. al., 1985).

Under General Velasco, it was decided to maintain or increase the size of the landholdings by distributing appropriated lands to peasant-owned, self-managed farming cooperatives rather than to individual farmers. Officially, the objectives of the agrarian reform were to to increase agricultural productivity and social peace. The basis of the reform in Peru was the much the same as as that which occurred in the neighboring country of Chile: to expropriate large landholdings and to distribute the land to the peasants who had previously worked on the estates (McClintock et. al., 1985). Agrarian reform laws stipulated that private individuals may own no more than 150 ha. of land and private

companies can not own any land (The Andean Report, 1990). The agrarian reform process continued throughout the 1970's until a democratic government took over in 1980. McClintock et. al., state "... by 1980 in Peru there was virtually no estates over 50 ha. on the Coast or over 30 ha. in the highlands and eastern Andean slopes (*ceja de selva*)" (McClintock et. al., 1985 p. 449).

When considering the pre-agrarian reform agricultural structures, Kay believes that "The latifundista-minifundista land tenure system generated both inequality and inefficiency" (Kay, 1982 p. 145). She further states that the large landowners used their land inefficiently, allowing large portions to be unattended or underutilized. Peasant farms, becoming increasingly fragmented due to population pressures, were over utilized. When considering the two alternative production units, Kay states "Nevertheless, average land and capital productivities were higher on peasant farms than on estates, while the opposite held true for average labor productivity " (Kay,1982 p. 146).

Several different production units were developed as a result of the agrarian reform. The most numerous are the agricultural production cooperative (CAPs), communal production cooperative (CPP) and the agricultural society of social interest (SAIS). The structure of these cooperative production units provides for the growing of crops on joint land holdings, raising livestock, sharing equipment and buildings, etc. (Cava Castillo, 1979).

Agricultural Extension

General agricultural extension theory

Before agricultural extension may be discussed on a theoretical basis, it must be clearly defined. Boone (1989) considers extension to be a system of non-formal education designed to teach people, help them with their needs and problems while inspiring them to be proactive (Boone, 1989). In Blackburn (1989), Rivera, Seepersad and Pletsch state the definition of agricultural extension varies widely and cite three distinct interpretations:

1. Agricultural Performance. Extension viewed only in terms of improving production and profitability of farmers.
2. Rural Community Development. Extension viewed as serving to advance rural communities, including improving their agricultural development tasks.
3. Comprehensive Non-formal Continuing and Community Education. Extension viewed as provider of non-formal agriculturally related-continuing education for multiple audiences: farmers, spouses, youth, community, urban horticulturists (Rivera, Seepersad and Pletsch, 1989 p. 140).

Baker (1989) also believes that individuals view the function of agricultural extension differently. He states extension may be viewed primarily as a tool for information dissemination, policy administration, technology transfer or education. He outlines the differences in each area as follows:

> Information Dissemination: may be portrayed as a one-way channeling of information: information such as statistical data, research results..... However, in extension work, information dissemination is more ideally a two-way process that accommodates and encourages feedback from potential users.
>
> Policy Administration: is the extending of various types of governing plans and strategies, usually from a central agency to a population that would be the potential recipients, or users, of the plans involved. Public, private and voluntary organizations all do this in varying contexts.
>
> Technology Transfer: is described by Fuller (1982) as a chain of functional steps, including research, development, transfer and diffusion of new knowledge, involving both "hard" (products) and "soft" (information) technologies.
>
> Education: is still by far the most widely accepted meaning of Extension, particularly among scholars and trained practitioners (Baker, 1989 p. 49).

Baker (1989) cites Mosher (1962) as saying extension as education originated in British universities "...where it became customary to have one educational program available on campus, and a second program away from the university buildings" (Baker, 1989 p. 49). The off-campus program "...was described by adding 'Extension' as a qualifying adjective to the noun 'Education'. Thus the term 'Extension Education' resulted" (Baker, 1989 p. 49).

Rivera, Seepersad and Pletsch (1989) describe the environment in which agricultural extension operates with the following statement: "It is influenced by forces outside the agricultural sector - such as education, transportation and irrigation and their development policies, planning and program delivery. It is also affected by forces within the

agriculture sector such as credit, supply inputs, research and marketing" (Rivera, Seepersad and Pletsch, 1989 p. 140). In regards to the environment of the agricultural sector, Francis (1985) considers the areas least understood by the agricultural scientist to be the cultural, educational, social and political factors in which a farmer operates. He believes the design and dissemination of new agricultural technology must take into account all of these factors (Francis, 1985).

The role of agricultural extension may vary according to the specifics objectives and needs to be meet. Baker (1989) contends that extension is a crucial element in rural development. He defines the key points in rural development as "...rural well-being, both in terms of economic aspects and non-tangible items such as health and education, the development of resources for increased production and efficiency and, organizational development involving the creation and maintenance of linkages by which people can usefully channel their energies for rural betterment" (Baker, 1989 p. 48). Boone (1989) has a similar viewpoint regarding the role of extension in rural development. He states "...Extension, at its best, focuses on attempting to improve the human condition" (Boone, 1989 p. 1).

Rivera, Seepersad and Pletsch (1989) cite the importance of the study of agricultural extension at the international level when they state:

> It is our view that the international and comparative study of agricultural Extension provides intellectual insight and the basis for practical action. One of the ways it does this is by helping us to understand perceptions and desires of key officials in other extension systems (Rivera, Seepersad and Pletsch, 1989 p. 139).

Rice, in his book Extension in the Andes, (1974) defined agricultural extension in the international context with the following statement: "In developing countries, where few farmers participate in vo-ag studies, extension is by definition the only channel available to the majority for getting advice that they can't get from their neighbors" (Rice, 1974 p. 24). Rivera states that in the lesser developed nations, most agricultural extension systems specifically target agricultural production services and do not disseminate more general types of information (Rivera, year unknown).

Rivera, Seepersad and Pletsch cite Chambers and Oxenham (1978) when they theorize that agricultural extension systems may be categorized by the point of control. They state that in the industrial, high income countries whose farmers have a higher level of education, extension has become demand driven, or directed towards fulfilling the informational requests of the farmers. In the lesser developed countries, extension services may be considered to be supply-driven as farmers have no other source of information and must take what they can get (Rivera, Seepersad and Pletsch, 1989).

The agricultural sector in Chile, Peru's neighbor to the South, has performed very well in the past years and, in some circles, is now considered to be a model for South American agricultural development. In a discussion of the elements required to ensure the successful transfer of agricultural technology, the following factors were identified:

1. The agricultural producer must be interested and motivated to participate in an agricultural extension program. They will respond to technology and information which they consider to be beneficial to them.
2. In order for economic benefits to be achieved, the existence of efficient technology is not enough, but a series of elements must be in place:
    a. available fair market prices for products;
    b. efficient marketing channels and structures;
    c. availability of agricultural inputs.

    All the above must be concurrently available in order for new technology to be economically viable.
3. It is necessary to have a strong linkage between agricultural research and technology transfer sectors.
4. The active participation of agricultural producers and producer organizations are required. Extension programs should be based upon the opinions and needs of the producers. For this to occur, producer participation is necessary.

5. The success of the extension programs are based upon the quality of the extension agents (Pontificia Universidad Catholica de Chile, July, 1985).

Rivera, Seepersad and Pletsch (1989) discuss the nature of agricultural extension in the international setting by describing three different institutional arrangements which are commonly found:

> 1) Agricultural (production-related) Extension Services: institutions which undertake knowledge transfer either as their sole function as in the case of the T & V system, or as the their primary function; at the same time, these institutions also include service activities and educational programs....
>
> 2) Integrated Agricultural Extension Services: institutions which include agricultural extension as an integrated function along with one or more primary functions, as with certain agricultural research programs, cooperatives, etc.;
>
> 3) Supportive Information Transfer Service: institutions - e.g. credit, supply, and marketing - which consider information transfer as a supportive function to their main concerns (Rivera, Seepersad and Pletsch, 1989 p. 145).

In the developing world, extension activities are most frequently carried out through the government via the Ministry of Agriculture. Generally the Ministry of Agriculture assigns the specific duties of extension to a department which may in turn have several subdivisions. In general, the chain of command from the Ministry of Agriculture to the extension agent working in a rural area, is clear. This method of administering extension programs is considered to be quite centralized.

A second approach to extension programs at occurs when the Ministry of Agriculture contracts with a paraestatal organization which in turn provides services for a limited geographic area or for specific crops or livestock species. This approach is less centralized and therefore may be more appropriate at the regional level (Rivera, date unknown; Rivera, Seepersad and Pletsch, 1989).

In their book, Managing Development in the Third World, Bryant and White (1982) discuss centralized rural development projects. They state the problem with such projects is "...that centrally directed projects are often very ineffective; frequently they are wasteful and ignore local interests and contributions" (Bryant and White, 1982 p. 159). Further, Bryant and White contend that centralized development projects too often neglect the poor. They believe that projects with a more even distribution of power are more successful. Projects with regional power bases "...have better flows of information from the lower levels, and so are better able to change" (Bryant and White, 1982 p. 160).

A discussion of agricultural extension would not be complete without considering the underlying principles on which extension programs ideally operate, both in the U. S. and in the international arena. In Blackburn (1989), Boone refers to these as tenets of extension education. A brief summary of these tenets are as follows:

1. Extensions primary concern should be that of empowerment: helping people to help themselves.
2. A consciousness of the learners sociocultural context is fundamental to effective programs of change.
3. Knowledge cannot be imposed; it can only be introduced.
4. Learners and their lifestyles must be valued by the extension institution and its professional staff.
5. Extension education is a multidisciplinary field in which technical knowledge is combined with skill in the process of planned change.
6. Extensionist cannot be effective with both educational and regulatory roles.
7. Extensionist must be idealistic. Those who work in the field must have faith in the client's ability to use knowledge to change his or her life.
8. Extensionist must use a rational, deliberate process of programming to bring about planned change.
9. Extensionist must concentrate on people.
10. If it is to have real and lasting impact, Extension education must be viewed as a continuous cycle of collaborative events (Boone, 1989 p. 8).

Boone emphasis that on the international scale, the regulatory aspect of extension must be removed. Extension personnel cannot gain the trust of the individuals with whom they work if they are expected to enforce government policies which are often unpopular. He further recommends greater integration of the technical portion of the extension agents work with the "behavioral or process component" (Boone, 1989 p. 9). He clarifies this statement by stating extension

agents may be well versed in a subject matter area, but may not be trained to effectively disseminate this information to the target audience (Boone, 1989).

Limitations to agricultural development in Peru

The agriculture sector in Peru has witnessed little growth over the past decades. This premise is evidenced by the modest growth of approximately 2% between 1950 and 1988 (Larios, 1989). Larios (1989) states this slow growth is due to the following factors which have hampered development efforts:

1. The "geographical division" which divides Peru into three natural and distinct regions: the coast, the jungle and the mountains (*sierra*). This results in certain crops being grown only in specific regions such as cotton, sugar cane and rice in the coastal region while potatoes, corn and wheat are grown in the *sierra*. The income generated per hectare varies greatly among the different crops.
2. The heterogeneity of the agricultural production units. These units differ by size (both physical and economic), geographic location, level of technology and the access to necessary inputs including access to agricultural credit. These differences have led Larios to use the following definitions when referring to the different producers:

a. The traditional producer is located on the coast and is characterized by having a level of development which is more technical, modern and commercial and which produces goods for both the internal and export markets.
b. The campesino producers have a lower level of development which may reach the subsistence level. These producers are generally found in the *sierra*. (Larios, 1989).

Larios states that perhaps the most important limitation to agricultural development in Peru is the macroeconomic policy towards agriculture of the government. These policies often are a disincentive to agricultural production while at the same time encouraging growth in other sectors of the economy such as industry (Larios, 1989).

Agricultural extension in Peru

In the decade of the 1970's, the agricultural extension system in Peru almost disappeared due the the emphasis the ruling military government placed on agrarian reform and land tenure. Cevallos (1989) contends that in the 1980's, the democratic government gave new attention and importance to the question of agricultural extension. To support his contention he cites the creation of the National Institute of Agricultural Research and Promotion (INIPA) in the early 1980's, which had the responsibility for managing agricultural extension programs (Cevallos, 1989). INIPA underwent reorganization in the late

1980's and, at the time of the study, the governmental agricultural extension programs were under the supervision of the Ministry of Agriculture in coordination with the National Institute of Agricultural Research (INIAA).

In a working paper presented to INIPA in 1985 regarding the role of research and extension in Peru, Carlos Pomareda Benel concluded that the primary reason for the low productivity in the agricultural sector was insufficient technology and agricultural inputs (Pomareda Benel, 1985). He states that the technology was either not available or not accessible. In a July 1985 report requested by INIPA, the International Service for National Agricultural Research (ISNAR), found that "Peru has had difficulty starting and maintaining the flow of improved technology essential for a science-based agriculture. Frequent reorganization of the research and extension system (8 or more times in 30 years), inadequate integration of the two major resources - funds from the Ministry of Agriculture and skilled researchers from the university system - and a lack of sustained monetary support for public research have been, and remain, major sources of these difficulties" (ISNAR, 1985 p. 2).

The ISNAR, in an in-depth critique the agriculture sector in Peru, concluded "Increased agricultural production will occur only when producers are motivated to increase production, and when there are efficient markets to supply essential inputs and receive increased

increased outputs ... These conditions require a coherent set of agricultural policies that seek to replace the imports of major food commodities with internal production..." (ISNAR, 1985 p. 2). To summarize, governmental policies towards agriculture as well as an efficient marketing structure are viewed as necessary if agricultural extension services are to be successful in encouraging farmers to increase their output and the overall supply of nationally produced food items.

The national survey of rural homes (ENAHR) which was conducted from August, 1983 to July, 1984, found that only 3.6% of all agricultural producers in Peru who were surveyed received agricultural extension services or technical assistance. This figure differs according to the geographic region of the country and the corresponding difference in the type of the production units (size and crops grown). In the coastal valleys of Peru, 7.3% of producers received extension services. This figure dropped to 3.6% in the jungle regions and 3.0% in the *sierra* (Ccama, 1987).

INIPA reported that in 1985, extension services were delivered to 37,000 agricultural producers which owned between one and one hundred hectares. The results of the ENAHR indicated that, on a whole, 56,631 producers received extension services and for those producers with between one to twenty hectares, the number was 45,316. The principle sources of the dissemination of technical

assistance was the Ministry of Agriculture which included INIPA (75.7%), the National Agrarian Bank (BAP) with 7.8%; independent professionals (3.3%); cooperatives 1% and other sources provided 12.2% (Ccama, 1987).

Ccama (1987) points out that in some areas such as the high Northern jungle region, the Ministry of Agriculture was the only source of assistance but in others, the BAP provided up to 32.2% of the extension services. He states that these statistics warrant concern regarding the level of coordination that exists between INIPA and BAP and concludes that efforts should be made to improve coordination (Ccama, 1987). Another area of concern discussed by Ccama in the ENAHR study is the high level of rejection of agricultural extension services by some agricultural producers. On a national average, 19.2% of agricultural producers did not accept the recommendation of the extension personnel for the following reasons: (1) 19,4% considered it to be unsound economic advice; (2) 30.5% because the advice was "inopportune"; (3) 11.2% because of the high cost involved, 36.5% due to a lack of confidence on the part of the producer and 14.4% for other various reasons. On a regional basis, 17.3% of the producers in the coastal region rejected extension advice, 21.5% in the sierra and 14,4% in the jungle region (Ccama, 1989).

The ENAHR revealed that access to credit by the agricultural producers was also very limited. On a national basis, only 7.5% of

producers included in the ENAHR received either formal or informal credit. Formal agricultural credit which is the responsibility of the National Agrarian Bank (BAP), was received by 6.7% of those surveyed. Ccama states that these figures are similar to those of an earlier study conducted by Salaverry in 1983, which revealed that in 1980, 7% of producers received credit from the BAP.

These national averages revealed regional disparities. In the coastal region, of the producers with urban residences, 40% received credit while the rural agricultural producers in the Northern, central and Southern *sierra* received 4.1%, 1.7% and 5.1% respectively (Ccama, 1987).

In an interview reported in the Peruvian newspaper El Comerico in June, 1989, the president of the National Agrarian Bank (BAP), Ing. Fuentes Barriga, declared that the minifundista to be one of the largest problems to the agriculture sector. He stated that it is not viable for a *campesino* to obtain sufficient resources from farming to provide himself with a decent standard of living. Ing. Fuentes Barriga believes the future of agricultural production in Peru lies in expanding the area under irrigation in the coastal region (El Comerico, July 25, 1989).

The ISNAR report to INIPA (1985) came to a very different conclusion than did the president of BAP. The ISNAR report stated:

> "Most of the needed increase in agricultural production (especially the much-needed increase by the smallholders in

> the Sierra and the coast), cannot come from increasing the cultivated area, but will have to come from increased productivity. That requires an additional element - improved technology. The research and extension system exist to develop and diffuse a flow of improved technology to producers, traders, processors, consumers, and policy makers. It does this by identifying and solving problems and taking advantage of opportunities to increase production (ISNAR 1985, p. 2).

Summary

Peru is a geographically diverse country which many social and economic problems including increasing levels of hunger and malnutrition. With the amount of farm land per rural resident averaging only .47 ha., Peru must increase it's agricultural production per hectare rather expand the area under cultivation (McClintock et. al., 1985). The extreme variations in the growing conditions of the different geographic regions of Peru create a disparity in income earned per hectare. This, coupled with the heterogeneity of the agricultural producers (Larios, 1989), the increasingly dangerous work conditions in the rural areas and the lack of financial resources available, creates a difficult environment in which the agricultural extension system must operate.

Under the military government of the 1970's, massive agrarian reform with wide-scale redistribution of land took place while agricultural extension activities were neglected. Increased attention was given to agricultural extension in the 1980's (Cevallos, 1989), but the ENAHR study revealed that by 1984, only 3.6% of the producers in

Peru received technical assistance and only 7.5% had access to agricultural credit (Ccama, 1987).

One of the primary limitations to agricultural production in Peru has been considered to be insufficient agricultural technology and access to inputs (Pomareda Benel, 1985). Lessons learned from the Chilean agricultural sector demonstrate the importance of the availability of agricultural inputs as well as a stable marketing system and fair prices for agricultural products. It is believed that if any one of these items is missing, new technology will not be economically viable (Pontificia Universidad Catholica de Chile, July, 1985).

Strong disagreement exists over how to increase agricultural production in Peru. The president of the National Agrarian Bank, the organization responsible for providing credit to agricultural producers throughout the country, believes small farmers are a detriment to the agricultural sector and looks to the technology of advanced irrigation systems as a solution (El Comerico, July 25, 1898). Other studies such as that done by the International Service for National Agriculture Research (ISNAR, 1985) urge support for the small farmers and increased emphasis on agricultural research and extension activities. Such divergent viewpoints coupled with governmental policies which have been detrimental towards the agriculture sector (Larios, 1989), indicate that many changes must occur before the agricultural sector in Peru may realize its full potential.

CHAPTER III. DESIGN AND PROCEDURES OF THE STUDY

The main purpose of this study was to develop a comprehensive profile of the institutions which promote agricultural development in Peru. A secondary purpose was to provide baseline data on the status of the agricultural extension system which may be utilized as a foundation for future related research. An additional purpose was to determine the needs and limitations of the agricultural extension system as perceived by individuals who were directly involved in promoting the development of the agricultural sector in Peru.

Based upon the perceptions of individuals who were defined as agricultural development promoters, the objectives of the study were: (1) To develop a comprehensive profile of organizations that were involved in promoting agricultural extension in Peru; (2) To determine the role of agricultural extension service and the role of extension agents; (3) To determine the limitations of the agricultural extension service and to the extension agents; (4) To identify the most important limitations and challenges that face agricultural production in Peru; (5) To compare perceptions of agricultural development promoters based on selected demographic data and area of employment (i.e., public, private and international sectors). Field research for this study was carried out between October, 1989, and September, 1990, during the time the author was working in Lima, Peru.

Research Questions

The following research questions were addressed in this study based upon the perceptions of the those individuals who were directly involved in promoting the development of the agricultural sector in Peru.

1. To what extent are agricultural extension services provided to producers?
2. To what extent should producers receive agricultural extension services?
3. What are the primary limitations to organizations that promote agricultural development?
4. What is the perceived role of agricultural extension agents?
5. What are the primary limitations of agricultural extension agents in conducting their work?
6. To what extent does coordination exist among agricultural development promoters?
7. Who should bear the cost of agricultural extension services?
8. What are the most important challenges facing agricultural production in Peru?
9. What is the descriptive profile of organizations which promote agricultural development in Peru?

Population of the Study

This study focused on the available institutional population of agricultural development promoters in Lima, Peru. Agricultural development promoters were defined as those individuals who work with institutions (i.e., the Ministry of Agriculture, agrarian universities, international development agencies, private research and extension organizations) which have the development of the Peruvian agricultural sector, either directly or indirectly, as a primary operational goal.

Based on the literature review and personal interviews with researchers who were involved in the agricultural sector in Peru, it was determined that a comprehensive listing of agricultural development promoters in the Lima area, either by individuals or by institutions, did not exist. It proved necessary to conduct an extensive, in-depth investigation which took approximately six months in order to identify the institutions which promote agricultural development in Peru which served as the basis for this study. A list of institutions which were identified may be found in Appendix F. The following is a partial list of research activities which were undertaken in this effort:

1. A review was made of all relevant informational directories of institutions working to promote agricultural development in Peru (i.e., national and private universities, research centers, government ministries, agricultural growers associations and international development agencies).

2. Personal interviews with researchers who study the agricultural industry in Peru were conducted.
3. The official national registry of private and international development institutions working in Peru was obtained from the National Institute of Planning (INP). When telephone numbers were included, telephone interviews were conducted to determine if the institutions were potential members of the research population (see Appendix C for a bibliography of references consulted).

Only those departments of each of the institutions identified which were directly involved with promoting the improvement of the agricultural sector in Peru were included in this study.

Originally, this study was designed to include agricultural development promoters from the twenty-four states and one province in Peru. Due to the unreliability of the public mail service and difficulties with private mail services, it was not possible to disseminate the questionnaires throughout the nation. The population was redefined to include the agricultural development promoters from the Lima metropolitan area.

As in many developing countries, the capital city of Peru is the center of decision-making and administrative activities. Research to identify the population for this study revealed that for practical and/or political purposes, the majority of the organizations that were involved in promoting agricultural extension have central offices in Lima. The results of the study indicated that the majority of the respondents worked with institutions

which had on-going agricultural development projects in the rural areas of Peru.

Initially, a total of 174 institutions were identified as members of the population for this study. Of these, 64 institutions were determined to be inappropriate for inclusion in the study based on one of the following criteria:

1) The institution had either left the Lima metropolitan area or was no longer in operation;
2) The institution did not work in the agricultural area;
3) The institution worked in the area of agricultural development in Peru, but there was no personnel in the Lima metropolitan area to answer the questionnaire.

Thirty-three originally identified potential institutional members of the population were excluded on the basis of criteria one, thirty-six were excluded on the basis of criteria two and twenty-six on the basis of criteria three. A final population of 110 institutions were identified. In an effort to accurately describe the population and to determine their perceptions, two questionnaires were delivered to each institution which was identified as being a member of the population. Two potential respondents from each institution included in the population were asked to complete the questionnaires. These respondents were employees of the institutions represented in the population. A summary of the population, questionnaires distributed and return rate is shown in Table 4.

Table 4. Research population

Research population	Number
Institutions initially identified	174
Institutions excluded based on criteria one	33
Institutions excluded based on criteria two	18
Institutions excluded based on criteria three	13
Total population of the study	110
Questionnaires distributed	348
Questionnaires excluded based on criteria one	66
Questionnaires excluded based on criteria two	36
Questionnaires excluded based on criteria three	26
Total questionnaires included in the study	220
Questionnaires answered	161
Questionnaires not returned or returned unanswered	59
Return ratio (percent)	73
Non-return ration (percent)	27

The respondents were asked to describe their work activities as belonging to one of the following categories: (1) project manager, (2) administrator, (3) agricultural technician, (4) researcher, (5) teacher and/or (6) project advisor. As many development programs in Latin America require employees to work in more than one position, the answers to this question were not mutually exclusive. Of the 161 respondents to the questionnaires, 18 or 11% did not answer this question. A description of the respondents may be found in Table 5.

Table 5. Description of respondents by position title (N=161)

Title	Number	Percent
Did not answer	18	11%
Project manager	60	42%
Administrator	58	41%
Agricultural technician	15	10%
Researcher	57	40%
Teacher	23	16%
Project advisor	67	47%

Research Design

Based upon the purpose and objective of this study, descriptive research methodology utilizing the survey approach was employed. Leedy states that descriptive research procedures may be utilized to process data which is gathered through simple observational situations. Such data may be either physically observed or collected through the use of a questionnaire (Leedy, 1985). In defining survey research, Leedy states:

> In employing this method, the researcher does two things: first, he observes with close scrutiny the population which is bounded by the research parameters; second, he makes a careful record of what he observes so that when the aggregate record is made, the researcher can then return to the record to study the observations that have been described there (Leedy, 1985).

A review of related literature revealed no instrument appropriate for use in this study. While a great deal of research on agricultural extension has been undertaken in Latin American countries, the situation in each country is unique. Peru's economic crisis, failing infrastructure, history of agrarian

reform, terrorist activities in the agricultural regions of the country and problems facing agricultural production combine to present a difficult environment in which the agricultural extension system operates. The objectives of this study required the development a comprehensive research instrument based upon the reality of Peru at the time the study was conducted.

Based upon a review of literature in the areas of needs assessment, descriptive research, agricultural extension theory and the economic, social, agricultural and extension situation of Peru, the instrument was developed by the researcher (Appendix B). The questionnaire was divided into four parts. The first part consisted of Likert-type questions developed to ascertain the perceptions of the potential respondents as stated in the research objectives. The second part of the questionnaire focused on the factors that limit agricultural production in Peru. The third portion was designed to gather data in order to describe the agricultural development projects of the institutions represented by the respondents. The information gathered from question five in this section was designed to collect information regarding the specific location of agricultural development projects (i.e. regions, valleys, etc.). The objective of collecting this data was to distribute it to the respondents of the study in order to increase their awareness of other institutions similar to their own with the hope of promoting networking. This information was not reported in this study but will be distributed to respondents along with the statistical

results. The final part of the questionnaire was constructed to gather information for the development of a descriptive profile of the both the organizations and individual members of the research population.

The questionnaire was tested for content validity by members of the research department of the Post-Graduate College of Business Administration (ESAN) located in Lima. The appropriate revisions were made and the questionnaire was then submitted to different members of the research department of ESAN for further testing. The questionnaire and corresponding research proposal were submitted to the Iowa State University Committee on the Use of Human Subjects in Research which approved the research instrument and methodology (Appendix E).

Based upon the primary purpose of the study, the development of a comprehensive profile of the agricultural extension system, all identified institutions which promote agricultural development in Peru were included. In order to achieve the research objectives, the potential respondents were asked to identify the structure of their institution based on the following categories: (1) private (belonging to the private sector); (2) public (belonging to the public sector); or (3) international (associated with an international organization). Respondents were asked to define the primary objective of their institutions as either research, education, administration or coordination. For the purposes of this study the following assumptions regarding the primary objective of institutions were made: (1) education included diffusion of information and technology transfer; and (2)

coordination included promotional activities.

Data were gathered using a five point Likert-type scale, with five the maximum and one the minimum response. The value labels differed among the questions. Open and closed ended questions were also utilized. Cronbach's alpha, used to determine the internal consistency and reliability of the Likert-type questions, yielded a reliability coefficient of .74.

Procedures

The majority of the data were collected in August and September of 1990 with a few questionnaires returned at a later date. Instrument packages, including two questionnaires and one cover letter, were delivered to the director of each organization or agency included in the study. The cover letter was signed by the researcher and the chairperson of the research department at the Post Graduate College of Business Administration (ESAN). Directors were requested to complete a questionnaire personally and to give the second instrument to an associate also working in the area of agricultural development or to pass both questionnaires to such individuals. Each instrument was coded to monitor return, responders remained anonymous. In an effort to increase the return rate, each organization which responded to the questionnaire was promised the results of the survey once the entire study was completed.

Instrument packages were delivered to each institution determined to be a member of the population. This approach was taken due to the

unreliability of the public mail service within the Lima metropolitan area. At the time of delivery, a signature was required to confirm delivery and to establish a contact person. Five to seven working days later, the contact person received a telephone call to inquire if the instrument has been completed. If the questionnaires had been completed, the research assistant returned to collect the instruments. If at the time of the first follow-up call the instruments were not completed, a follow-up call was made three to five working days later. This procedure continued until: (1) both completed research instruments were returned; (2) one completed instrument was returned and the second was either returned blank or it was indicated that it would not be completed; or (3) both questionnaires were returned blank or it was indicated that neither would be completed.

Analysis of Data

The data were coded and entered onto the Iowa State University mainframe computer using the Statistical Package for the Social Sciences (SPSSx). All questionnaires were reviewed for coding accuracy. Descriptive statistics were calculated using the SPSSx program FREQUENCIES. This procedure provided frequency counts, standard deviations, percentages and means which were utilized to provide a descriptive overview of the data. Cronbach's alpha was run on the Likert-type questions (item 1 to item 15) to determine the reliability of the research instrument and to estimate internal consistency.

The oneway analysis of variance program (ANOVA) utilizing composite scores of item 1 through item 15 was employed to determine if there were significant differences in the perceptions among respondents based on selected demographic data. The Duncan post-hoc test was used at the .05 level to determine where significant differences were located.

Limitations of the Study

This study was limited by several factors. Perhaps the most important limitation was the rapidly changing economic and political situation in Peru. Wide-spread economic reforms were implemented by the presidential administration which took office in July, 1990, in an effort to control the hyper-inflation, social unrest and terrorism which has plagued Peru for the past several years. Although it was clear that these measures would have a direct impact on the agricultural sector, it was impossible to predict what changes would occur. Specifically, political reforms pertaining to food subsidies, trade legislation and established agrarian reform laws will have a major impact on the agricultural sector.

An additional limitation of this study was the lack of direct access to agricultural development promoters in the areas outside of Lima. This limitation was due in part to the inability of the researcher to disseminate the research instrument outside of the capital city. While all potential dissemination methods were investigated, none proved to be both feasible and reliable. At the time the study was conducted, the state of public

services and infrastructure prevented reliable mail service to the regional capitals and rural areas. The lack of access to the rural areas was not a serious limitation as the majority of respondents indicated involvement with project activity in one or more of the rural areas outside of Lima.

The language difference may be considered to be a limitation. As the research was conducted in Spanish and reported in English, it was necessary that all research findings as well as a majority of the materials used for the literature review be translated by the author. A final limiting factor was the lack of a previously established listing or directory of either the individuals or or institutions which promote agricultural development in Peru. This process of identifying these individuals and/or institutions proved to be an extremely complex and difficult endeavor. A partial list of the resources which were utilized to determine the population may be found in Appendix C. A list of the institution which were identified may be found in Appendix F.

CHAPTER IV.

PRESENTATION AND ANALYSIS OF DATA

In this chapter the results of the analysis of data are presented. The main purposes of this study were to develop a comprehensive profile of institutions which promote agricultural development in Peru and to provide baseline data on the status of the agricultural extension system as a foundation for future related research. A secondary purpose was to determine the perceived needs and limitations of the agricultural extension system on the part of those individuals who were directly involved in promoting the development of agriculture.

The specific objectives of the study were as follows:

1. To develop a comprehensive profile of organizations that were involved in promoting agricultural extension in Peru.
2. To determine the role of agricultural extension education and the role of agricultural extension agents as perceived by individuals who are defined as agricultural development promoters.
3. To determine the limitations of agricultural extension education and agricultural extension agents as perceived by agricultural development promoters.
4. To identify the most important limitations and challenges that

face agricultural production in Peru as perceived by agricultural development promoters.

5. To compare perceptions of agricultural development promoters with selected demographic data.
6. To compare selected perceptions among agricultural development promoters who are employed in the public, private and international sectors.

This data presented in this chapter are divided into the following sections: (1) the demographic characteristics of the respondents; (2) descriptive profile of the institutions represented in the population; (3) perceptions presented in rank order by mean; (4) Reliability Tests and (5) Oneway Analysis of Variance with Duncan Post-Hoc Tests utilizing composite scores of perceptions and selected independent variables.

Cronbach's Alpha procedure was utilized to determine the reliability of the instrument. The alpha coefficient for the perception statements, item 1 through 15, was .76 (N=161).

Demographic Characteristics of Respondents

Gender

The distribution of respondents by the variable "gender" is shown in Figure 1. Of the 161 usable questionnaires, 141 (91.3%) of the respondents were male, 10 (6.2%) were female and 4 (2.5%) did not

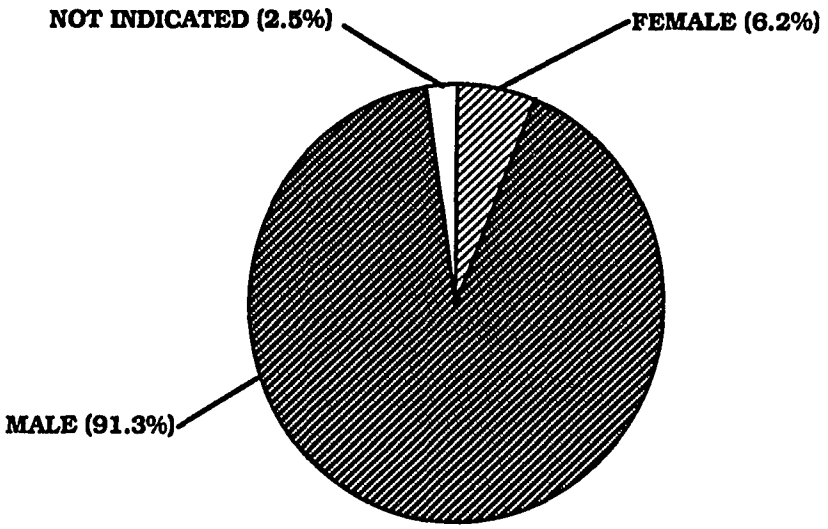


Figure 1. Distribution of agricultural development promoters in Peru by gender (N = 161)

indicate their gender.

Age

Respondents were asked to state their age. For the purposes of data analysis and presentation, this information was grouped into the following four categories: (1) age 34 and below; (2) age 35 to 44; (3) age 45 to 54, and (4) age 55 and above. A total of 32 (20%) respondents were age 34 or less; 47 (29%) were between ages 35 and 44; 43 (26.7%) were between ages 45 and 54, and 30 (18.7%) were age 55 or above. A total of 9 respondents (5.6%) did not indicate their age. The results may be found in Figure 2.

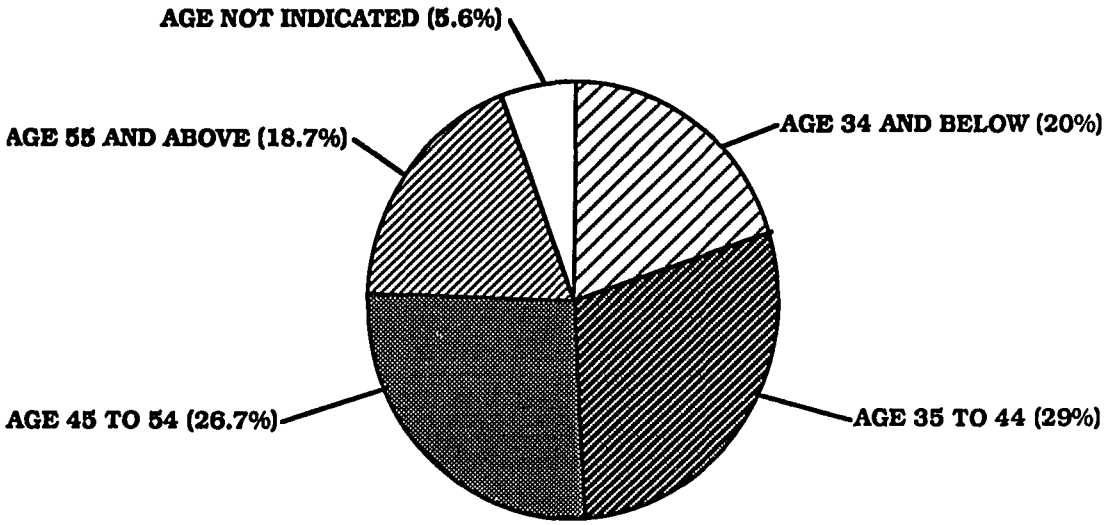


Figure 2. Distribution of agricultural development promoters in Peru by selected age groups (N=161)

Nationality

The members of the population were from a total of 10 different countries with 148 respondents (91.9%) from Peru, 9 (5.6%) from countries other than Peru and 4 (2.5%) not indicating their nationality. Table 6 shows detailed information concerning respondents' nationality.

Educational level

Respondents were asked to identify their highest level of education attained using categories established by the researcher. Data from the respondents were presented in Figure 3. The responses, by each

Table 6. Nationality of agricultural development promoters in Peru by number and percent

Country	Number	Percent
Peru	148	91.9
Brazil	1	.6
Germany	1	.6
Spain	1	.6
Colombia	1	.6
El Salvador	1	.6
Venezuela	1	.6
United States	1	.6
France	1	.6
Belgium	1	.6
Not indicated	4	2.5
Total	161	100

category are as follows: (1) primary school: 1 (.6%); (2) high school: 2 (1.2%); (3) technical studies: 5 (3.1%); (4) bachelors degree: 86 (53.5%); (5) masters degree: 41 (25.5%), and (6) doctorate degree: 20 (12.4%) with 6 (3.7%) not indicating their highest degree of education earned. The majority, 147 (91%) were college or university graduates.

Area of specialization of highest degree earned

Table 7 demonstrates the diversity in the academic background of the respondents by listing the subject matter area of specialization for the highest degree earned.

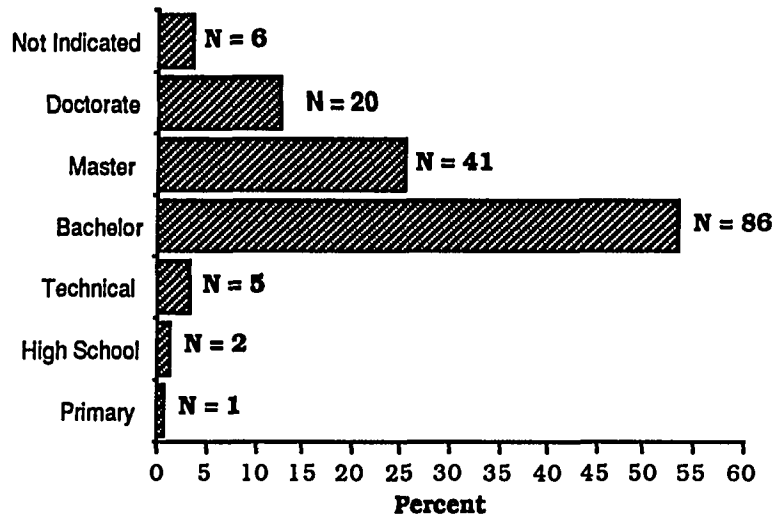


Figure 3. Highest level of education attained by agricultural development promoters in Peru (N = 161)

Country in which highest degree was earned

Of the total population, the majority of the 161 respondents, 94 (58.4%) earned their highest academic degree in Peru and 61 (37.9%) did so outside of Peru. A total of 6 respondents (3.7%) did not answer this question. Table 8 provides detailed information by country.

Number of years of experience working in agriculture

Respondents were asked to identify the numbers of years which they had been working in agriculture. To facilitate analysis and presentation, the data were grouped into the following categories: (1) 9

Table 7. Subject matter area of the highest degree earned by agricultural development promoters in Peru

Degree area	Frequency	Percent
Sociology	8	5.0
Agricultural economics	11	6.8
Agricultural production	15	9.3
Planning	4	2.5
Economics	10	6.2
Animal Science	17	10.8
Agricultural journalism	1	.6
Agronomy	16	9.9
Entomology	1	.6
Rural development	4	2.5
Anthropology	5	3.1
Management studies	5	3.1
Law	2	1.2
Agricultural business	8	5.0
International development	1	.6
Agricultural extension education	6	3.7
Irrigation	3	1.9
Natural resources	6	3.7
Engineering	2	1.2
Genetics	2	1.2
Soil science	3	1.9
Statistics	1	.6
Horticulture	3	1.9
Forestry	3	1.9
Physics	1	.6
Agricultural policy studies	2	1.2
Linguistics	1	.6
Education	4	2.5
General studies	10	6.2
Not indicated	6	3.7
Total	161	100

years of work experience or less; (2) 10 to 19 years of work experience; (3) 20 to 29 years of work experience; (4) 30 or more years of work

Table 8. Country in which highest degree was earned by agricultural development promoters in Peru

Country	Frequency	Percent
Peru	94	58.4
United States	21	13.0
France	7	4.4
Belgium	5	3.2
Mexico	4	2.5
Chile	4	2.5
Argentina	4	2.5
Germany	3	1.9
Brazil	3	1.9
Italy	2	1.2
Israel	2	1.2
Venezuela	2	1.2
Spain	1	.6
Colombia	1	.6
Holland	1	.6
Russia	1	.6
Not indicated	6	3.7
Total	161	100

experience. A total of 36 (22.4%) had 9 years or less of experience working in agriculture; 45 (28%) had 10 to 19 years; 35 (21.7%) had 20 to 29 years; 34 (21.1%) identified themselves as having more than 30 years of work experience in agriculture while 11 respondents (6.8%) did not answer the question. The data are shown graphically in Figure 4.

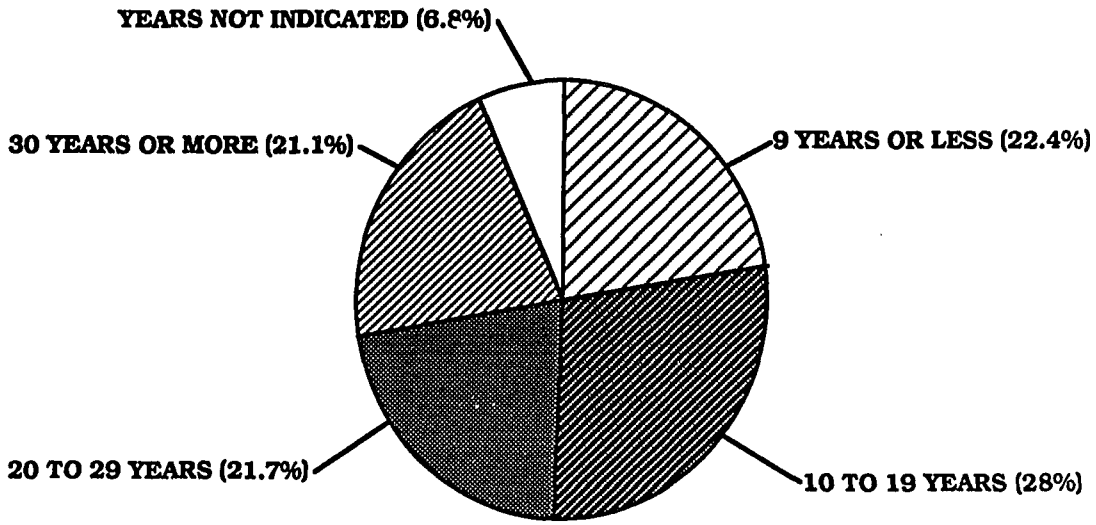


Figure 4. Number of years of experience working in agriculture by agricultural development promoters in Peru

Job responsibilities

Respondents were asked to select among different job responsibilities and positions in categories preestablished by the researcher. As it is common to have more than one job responsibility and/or work title in Latin America, the various potential answers provided for selection by the respondents were not mutually exclusive. Respondents were asked to select all position titles which applied to them and to indicate the percentage of time dedicated to each selection. Due to the fact that only a very small number of respondents provided the corresponding percentage data and that which was supplied was inconsistent, the percentage portion of the information

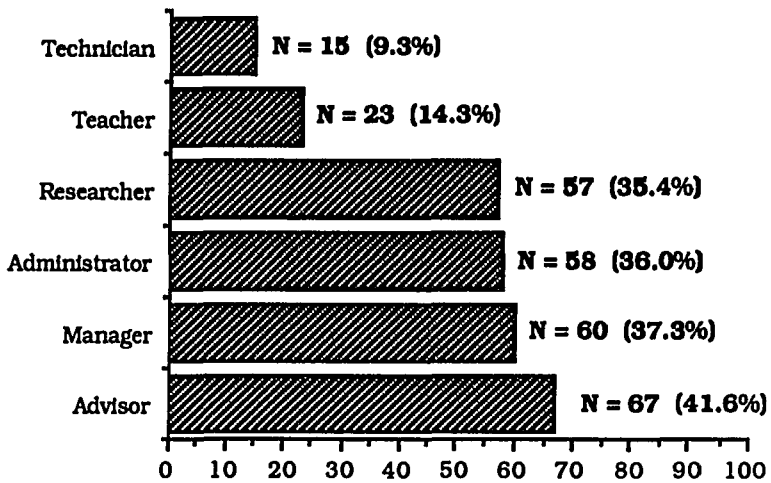


Figure 5. Job responsibilities held by agricultural development promoters in Peru (N = 161)

was not included in data analysis. A summary of the job responsibilities held by the respondents may be found in Figure 5.

Descriptive Profile of Institutions

In meeting one of the main objectives of this study, i.e.,. to develop a comprehensive profile of organizations that were involved in promoting agricultural extension education in Peru, the following section provides a description of the institutions and departments of which the respondents were members.

Definition of institutions

Respondents were asked to identify the institution or organization of which they were a member based on one of the following categories: (1) private (belonging to the private sector); (2) public (belonging to the public sector), or (3) international (member of an international organization). Respondents were asked to limit their response to the one category which best described their institution. A total of 96 (59.6%) respondents defined their place of employment as belonging to the private sector; 43 (26.7%) as part of the public sector; 21 (13%) as being a member of an international organization and 1 (.6%) not

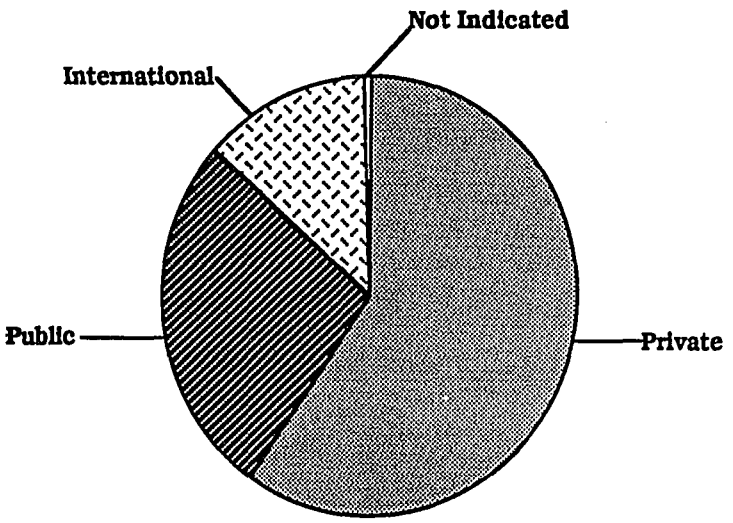


Figure 6. Definition of institutions working to promote agricultural development in Peru (N = 161)

answering the question. Data are presented in Figure 6.

Principle objective of the institutions

Respondents identified the principle objective of the institution for which they were employed as belonging to one of the following categories pre-established by the researcher: (1) research: 32 (19.9%); (2) education: 49 (30.4%); (3) administration: 15 (9.3%); and (4) coordination: 54 (33.5). A total of 11 respondents (6.8%) did not indicate the principle objective of their institution. Data are presented graphically in Figure 7.

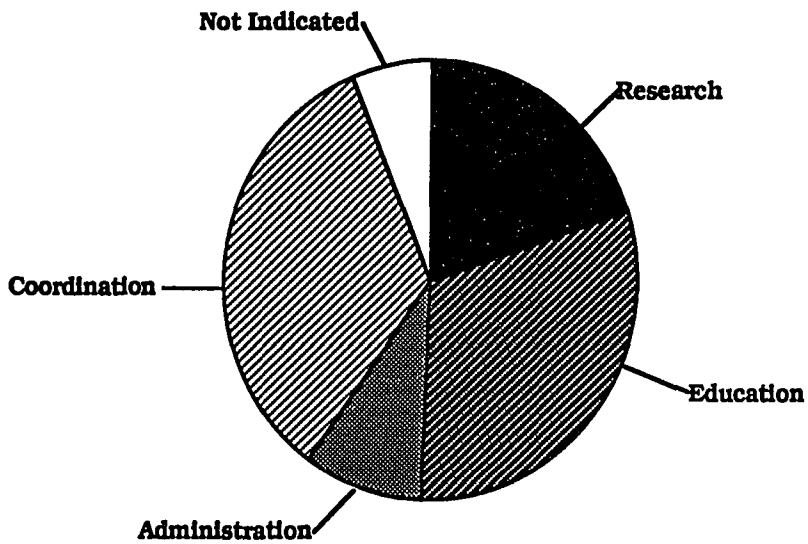


Figure 7. Principle objective of institutions working to promote agricultural development in Peru (N = 161)

Sources of funding

Members of the population were asked to indicate the principle sources of funding for their institutions or, if appropriate, for the specific department in which they worked. It was expected that institutions would receive funding from more than one source, therefore the categories which were predetermined by the researcher were not considered to be mutually exclusive. Data are presented in Figure 8. Respondents were asked to select all sources from which their institutions received funding and to indicate the percentage of funding obtained from each selection. Due to the fact that only a very small number of respondents provided the corresponding percentage data and that which was supplied was inconsistent, this portion of the information was not included in data analysis. A total of 14 (8.7%) respondents did not answer this question, leaving 147 respondents.

Types of funding

The different types of funding received by the institutions or, if appropriate, by the specific department in which respondents were employed, are shown in Figure 9. It was anticipated that organizations received more than one type of funding and therefore, the three categories of responses identified by the researcher were not mutually exclusive. Respondents indicated that 86 (53.4%) organizations

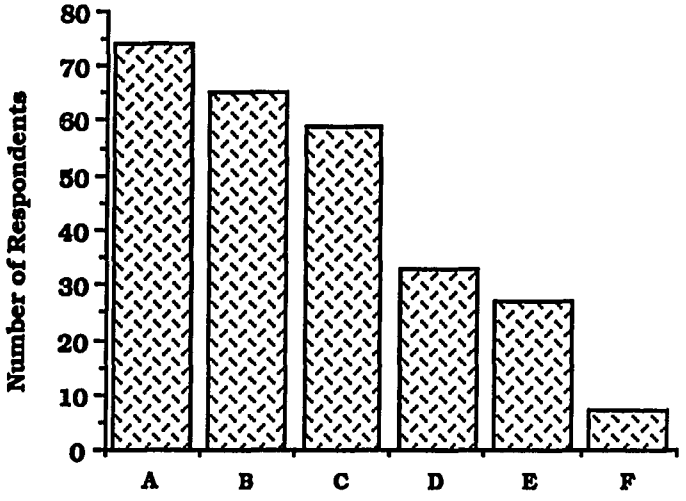


Figure 8. Sources of funding for institutions involved in the promotion of agricultural development in Peru (N = 147)

A = Rank #1: International sources (n = 74, 50.3%)
B = Rank #2: Service to clients (n = 65, 44.2%)
C = Rank #3: Peruvian government (n = 59, 40.1%)
D = Rank #4: Non-governmental organizations (n = 33, 22.4%)
E = Rank #5: Private funds (n = 27, 18.4%)
F = Rank #6: Peruvian banks (n = 7, 4.8%)

received funding in the form of donations; 17 (10.6%) in the form of loans, and 55 (34.2%) generated funds from services to clients. Respondents were asked to indicate the percentage of funding obtained in each of the three forms. Due to the fact that only a very small number of respondents provided the corresponding percentage data and that which was supplied was inconsistent, this portion of the information was not included in data analysis.

Activities

Members of the population were asked to identify the activities which were undertaken by the institutions or if appropriate, by the specific department in which they were employed. A list of potential activities was provided by the researcher from which respondents reported the following activities: (1) research: 95 (67.4%); (2) technical assistance to individually owned and/or operated farms: 86 (62.0%); (3) project administration: 69 (49.0%); (4) technical assistance to agricultural cooperatives: 58 (41.2%); (5) promotion of products or service to clients: 54 (38.3%), and (6) teaching 50 (31.1%). It was anticipated that institutions would undertake more than one activity and therefore the categories provided were not mutually exclusive. Respondents were asked to select all activities in which their institution or department was involved and to indicate the percentage of time which corresponded to each category selected. Due to the fact that only a very small number of respondents provided the corresponding percentage data and that which was supplied was inconsistent, this portion of the information was not included in data analysis. Activities are summarized in Figure 10.

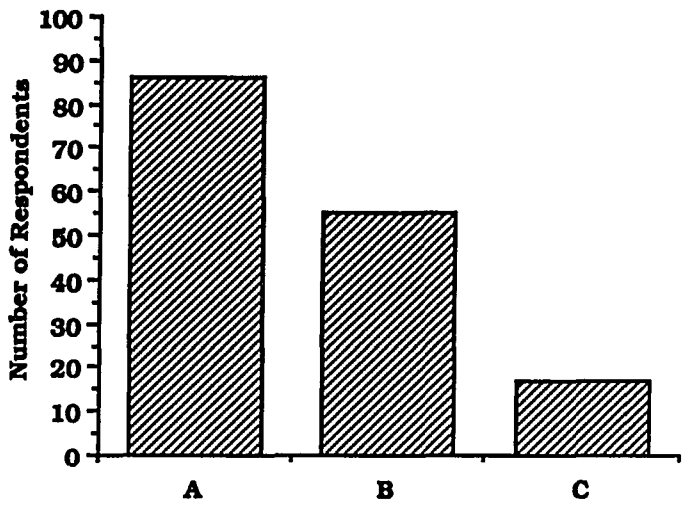


Figure 9. Types of funding for institutions involved in the promotion of agricultural development in Peru (N = 158)

A = Rank #1: Donations (n = 86, 53.4%)
B = Rank #2: Generated from service to clients (n = 55, 34.2%)
C = Rank #3: Loans (n = 17, 10.6%)

Clients

A description of the clients to which the activities of the institutions or departments were directed is illustrated in Table 9. Categories listing potential clients were predetermined by the researcher. Respondents were asked to select all the client categories which applied to their organization and the answers are therefore not mutually exclusive.

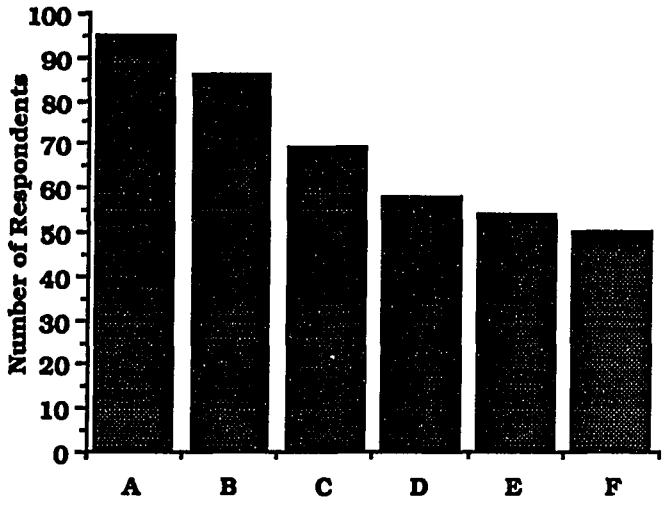


Figure 10. Activities undertaken by institutions or departments involved in the promotion of agricultural development in Peru (N =141)

A = Rank #1: Research (n = 95, 67.4%)
B = Rank #2: Technical assistance to individually owned and/or operated farms (n = 86, 61%)
C = Rank #3: Project administration (n = 69, 49%)
D = Rank #4: Technical assistance to agricultural cooperatives (n = 58, 41.2%)
E = Rank #5: Promotion of products or service to clients (n = 54, 38.3%)
F = Rank #6: Teaching (n = 50, 35.5%)

Number of years the institutions had been active in agriculture

The number of years the institution or department had been active in the agricultural area at the time of data collection is shown in Figure 11. The data were collected in raw form and placed into the following

Table 9. Clients of the organizations involved in the promotion of agricultural development in Peru (N = 140)

Client	Frequency	Percent
Minifundistas (0 to 3 ha.)	103	74.0
Small producers (4 to 10 ha.)	112	80.0
Medium producers (11 to 20 ha.)	85	61.0
Large producers (21 or more ha. individually owned)	59	42.0
Landless agricultural workers	41	29.0
Agricultural cooperatives	69	49.0
Food processing organizations	33	24.0
Food distributors and transporters	10	7.1
Banks and other financial institutions	13	9.3
Non-governmental institutions	48	34.0

categories by the researcher to facilitate analysis and presentation: (1) 9 years or less: 62 (38.5%); (2) 10 to 19 years: 35 (21.7%); (3) 20 years or more: 50 (31.1%). Fourteen respondents did not answer this question.

Size of the organizations

The respondents were asked to provide information regarding the number of people working in the institutions or departments where they were employed in order to determine the size of the organizations. Raw data was collected and placed into categories by the researcher to facilitate the analysis and presentation. The categories and corresponding data are as follows: (1) 1 to 5 employees in the

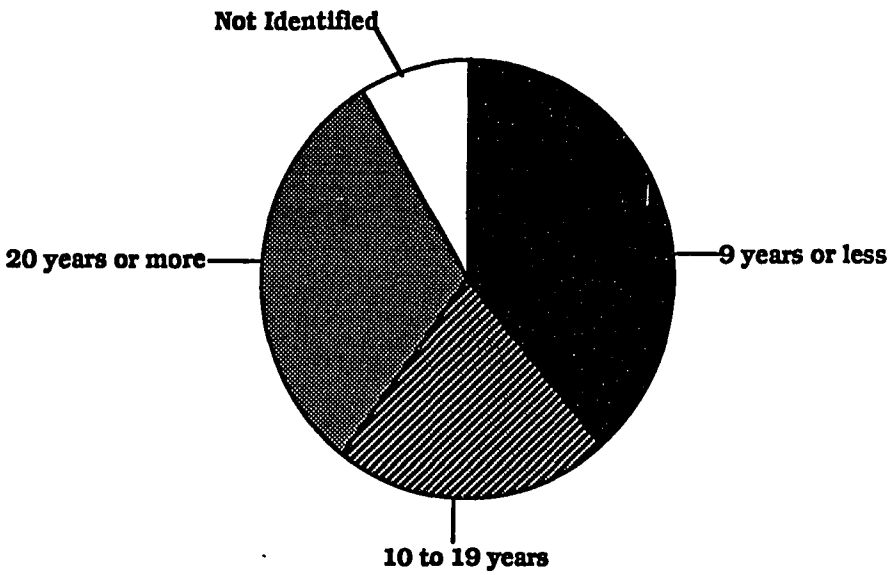


Figure 11. Number of years organizations involved in the promotion of agricultural development in Peru have been active in agriculture (N = 161)

institution or department: 31 (19.8%); (2) 6 to 10 employees: 21 (13.0%); (3) 11 to 15 employees: 12 (7.5%); (4) 16 to 20 employees: 12 (7.5%, and (5) more than 21 employees: 24 (14.9%) with 60 (37.3%) respondents not answering the question. The data are presented in Figure 12.

Projects

The following tables provide a profile of the project activity of the institutions in which the respondents were employed. Table 10 indicates the number of agricultural projects which were in the

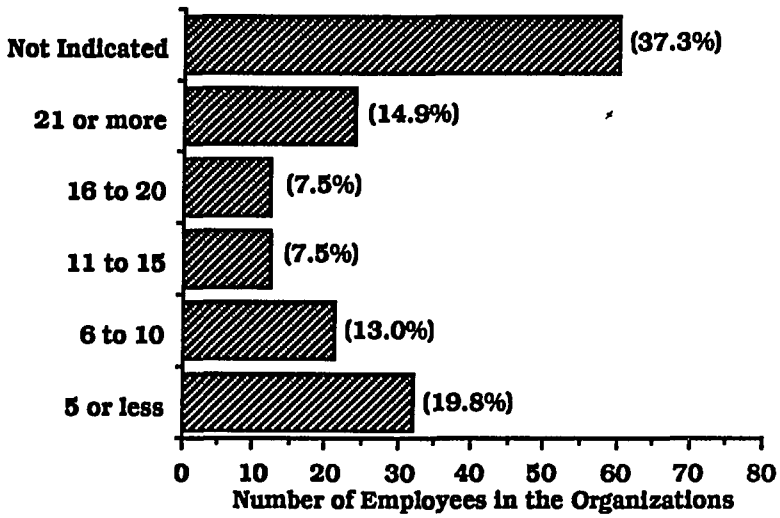


Figure 12. Size of the organizations involved in the promotion of agricultural development in Peru (N = 161)

planning and/or proposal stage at the time the data were collected. Table 11 indicates the number of agricultural projects which were either in progress at the time the data were gathered or had been undertaken in the previous five years.

Table 12 identifies the number of projects that were either in the planning and/or proposal stage at the time the data were gathered and the projects which were in progress or had been undertaken in the previous five years which included an agricultural extension component. Table 13 identifies the number of projects that were either in the planning and/or proposal stage at the time the data were gathered and

Table 10. Number of agricultural projects in the planning or proposal stages in Peru (N = 161)

Number of Projects	Frequency	Percent	Total Number of Projects
0	6	3.7	0
1	24	14.9	24
2	28	17.4	56
3	13	8.1	39
4	5	3.1	20
5	11	6.8	55
6	3	1.9	18
7	3	1.9	21
8	2	1.2	16
10	4	2.5	40
12	1	.6	12
15	3	1.9	45
20	1	.6	20
23	1	.6	23
45	1	.6	45
Not Indicated	55	34.2	- -
Total:	- -	100	434

the projects which were in progress or had been undertaken in the previous five years which were conducted in coordination with other organizations.

Table 11. Number of agricultural projects in progress or undertaken in the past five years in Peru (N = 161)

Number of Projects	Frequency	Percent	Total Number of Projects
0	5	3.1	0
1	15	9.3	15
2	17	10.6	34
3	16	9.9	48
4	8	5.0	32
5	10	6.2	50
6	11	6.8	66
7	2	1.2	14
8	5	3.1	40
9	1	.6	9
10	2	1.2	20
11	2	1.2	22
12	2	1.2	24
15	2	1.2	30
20	2	1.2	40
22	2	1.2	44
30	1	.6	30
50	1	.6	50
Not Indicated	58	36.0	- -
Total:	- -	100	568

Table 12. Total projects which included agricultural extension in Peru (N = 161)

Number of Projects	Frequency	Percent	Total Number of Projects
0	9	5.6	0
1	24	14.9	24
2	15	9.3	30
3	14	8.7	42
4	10	6.2	40
5	1	.6	5
6	10	6.2	60
7	4	2.5	28
8	5	3.1	40
10	3	1.9	30
11	2	1.2	22
13	1	.6	13
16	1	.6	16
20	4	2.5	80
23	1	.6	23
28	1	.6	28
50	1	.6	50
Not Indicated	55	34.2	- -
Total:	- -	100	531

Table 13. Total projects which were conducted in coordination with other organizations in Peru (N = 161)

Number of Projects	Frequency	Percent	Total Number of Projects
0	12	7.5	0
1	17	10.6	17
2	21	13.0	42
3	16	9.9	48
4	8	5.0	32
5	3	1.9	15
6	7	4.3	42
7	4	2.5	28
8	2	1.2	16
10	2	1.2	20
11	2	1.2	22
12	1	.6	12
15	2	1.2	30
16	1	.6	16
20	1	.6	20
23	1	.6	23
28	1	.6	28
Not Indicated	60	37.3	- -
Total:	- -	100	411

Perceptions of the Role and Limitations of Agricultural Extension

The following section is based upon two of the specific objectives of this study: (1) to determine the role of agricultural extension education in Peru and, (2) to determine the limitations of agricultural extension education, both as perceived by the members of the research population

who were defined as agricultural development promoters. All questions were based upon a five point Likert-type scale with potential answers varying according to the specific question.

Based upon a five point Likert-type scale with '5' as strongly agree and '1' strongly disagree, the data in Table 14 address the respondents' views of who should bear the cost of agricultural extension services in Peru. The results indicate the respondents believed the government should not bear the entire cost of extension services ($x = 1.87$; S.D. = 1.23) and that a preferable alternative would be for services to be provided by a coordinated effort between the government, universities, private business, and international aid agencies ($x = 3.95$; S.D. = 1.18).

Respondents were asked to what extent they agreed with a variety of statements designed to assess their perceptions on issues basic to the agricultural extension system in Peru. The results, based upon a scale of strongly agree/disagree, are presented in Table 15. With a mean of 4.87 and a standard deviation of .42, respondents felt strongly that the development of the agricultural sector is necessary to solve the economic crisis that exists in Peru and that improving agricultural extension services should be a priority of future governments ($x = 4.73$; S.D. = .54). In addition, with a mean of 1.53 and a standard deviation of .80, respondents did not believe that in reality, agricultural extension services increase agricultural production in Peru.

Table 14. Rank, means and standard deviations of statements regarding costs of agricultural extension services as perceived by agricultural development promoters in Peru

Rank	Item	Valid Cases	Mean	S.D.
Cost of agricultural extension services should be:				
1	Provided by a coordinated effort between the government, universities, business, and private and international organizations	152	3.95	1.18
2	Paid by the client according to his/her capabilities and subsidized by the Peruvian government	138	3.62	1.29
3	Paid 100% by the agricultural producer	142	2.47	1.34
4	Provided 100% by the government	141	1.87	1.23

Scale: 5 = Strongly agree; 1 = Strongly disagree

Regarding the level of coordination that exists between groups that promote agricultural development in Peru, on a five point Likert-type scale, respondents were asked to strongly agree/disagree with several relevant statements. Respondents agreed strongly that the increased coordination of agricultural development projects would result in improved services to agricultural producers ($\bar{x}$ = 4.67; S.D. = .61). They also believed strongly they could improve their work if they coordinated activities with institutions working in areas similar to theirs ($\bar{x}$ = 4.58; S.D. = .69). Complete responses are shown in Table 16.

Table 15. Rank, means and standard deviations of statements regarding the agriculture sector as perceived by agricultural development promoters in Peru

Rank	Item	Valid Cases	Mean	S.D.
Extent respondents believed:				
1	The development of the agricultural sector is necessary to solve the current economic crisis	160	4.87	.42
2	Improving agricultural extension services should be a priority of future governments	160	4.73	.54
3	In theory, agricultural extension services increase agricultural production	158	4.20	1.10
4	The focus of agricultural production should be for exportation	158	3.55	.99
5	The focus of agricultural production should be for national consumption	158	3.60	1.24
6	Agricultural extension services are adequate in Peru	156	2.78	1.22
7	In reality, agricultural extension services in Peru increase agricultural production	160	1.53	.80

Scale 5 = Strongly agree; 1 = Strongly disagree

Table 17 shows the perceptions of the respondents when asked whom they believe should be responsible for the coordination and implementation of agricultural extension programs in Peru. Respondents indicated they strongly prefer projects be coordinated and implemented jointly by the government, universities, non-governmental

Table 16. Rank, means and standard deviations on statements regarding level of coordination to promote agricultural development as perceived by agricultural development promoters in Peru

Rank	Item	Valid Cases	Mean	S.D.
Regarding the level of coordination between groups that promote agricultural development, extent respondents agreed:				
1	Increased coordination of agricultural development projects would result in improved services to agricultural producers	155	4.67	.61
2	You could improve your work if you coordinated activities with institutions or departments working in areas similar to yours	153	4.58	.69
3	There should be one main center for coordinating agricultural extension service programs	155	4.40	.94
4	You personally are well informed of projects undertaken by institutions or departments working in areas similar to yours	155	2.87	1.01

5 = Strongly agree; 1 = Strongly disagree

organizations and the private sector (x = 7.73; S.D. = .60) and not exclusively by governmental institutions (x = 1.96; S.D. = 1.19).

Based upon a 5 point Likert-type scale with '5' very efficient and '1' very inefficient, the respondents were asked to what extent they believed different farming units to be efficient in agricultural production. Respondents perceived the corporate farms to be the

Table 17. Rank, means and standard deviations on statements regarding the coordination and implementation of agricultural extension programs as perceived by agricultural development promoters in Peru

Rank	Items	Valid Cases	Mean	S.D.
The coordination and implementation of agricultural extension programs should be the responsibility of:				
1	Jointly by the government, universities, non-governmental organizations and the private sector	157	4.73	.60
2	Independently by those who have an interest and the necessary resources	149	2.67	1.25
3	Exclusively by governmental institutions	149	1.96	1.19

Scale: 5 = Strongly agree; 1 = Strongly disagree

most efficient (X = 4.23; S.D. = .84) and the Minifundista, with 0 to 3 hectares of land, to be the least efficient (x = 2.33; S.D. = 1.19). Data are shown in Table 18.

Utilizing the previously stated "very efficient/inefficient" Likert-type scale, members of the population were further asked to provide their views on the efficiency of the management of the different agricultural production units found in Peru. Similar to the ranking in the previous question, the respondents perceived corporate farms to be most efficient in management (x = 4.28; S.D. = .75) and the minifundistas to be the least (x = 2.11; S.D. = 1.14). However, regarding the efficiency of management, members of the population found the large individually

Table 18. Rank, means and standard deviations for statements regarding production efficiency of farming units as perceived by agricultural development promoters in Peru

Rank	Item	Valid Cases	Mean	S.D.
Extent farming units efficient in agricultural production:				
1	Corporate farms	144	4.22	.84
2	Medium (11 to 20 ha.)	148	3.91	.86
3	Large individually owned units (more than 21 ha.)	148	3.73	.99
4	Small (4 to 10 ha.)	145	3.44	1.01
5	Cooperative farms (CAPS, SAIS)	147	2.42	1.03
6	Minifundista (0 to 3 ha.)	146	2.33	1.19

Scale: 5 = Very efficient; 1 = Very inefficient

owned farms (more than 21 ha.) to be more efficient (x = 3.70; S.D. = 86) than the medium sized farmers (x =3.50; S.D. = .95), the reverse of what was perceived to be true when considering the extent to which they were efficient in agricultural production. Data are shown in Table 19.

Based upon the of scale of '5' extensive services and '1' no services, respondents were asked their opinions regarding who actually receives agricultural extension services in Peru. The results of this question indicate the respondents did not feel strongly that any of the various

Table 19. Rank, means and standard deviations of statements regarding management efficiency of production units as perceived by agricultural development promoters in Peru

Rank	Item	Valid Cases	Mean	S.D.
Extent farming units efficient in management:				
1	Corporate farms	143	4.28	.06
2	Large individually owned units (more than 21 ha.)	148	3.70	.86
3	Medium (11 to 20 ha.)	147	3.50	.95
4	Small (4- to 10 ha.)	145	2.83	1.13
5	Cooperative (CAPS, SAIS)	146	2.54	1.01
6	Minifundista (0 to 3 ha.)	145	2.11	1.14

Scale: 5 = Very efficient; 1 = Very inefficient

types of faring units received either extensive services nor some services. It was perceived however, that the Minifundistas (0 to 3 ha.) received very few services ($\bar{x}$ = 1.69; S.D. = .89) as did the medium sized farmers with 11 to 20 ha. ($\bar{x}$ = 2.13; S.D. = of .81). Results are presented in Table 20.

Based upon the Likert-type scale extensive services/no services, the respondents were asked to give their perceptions regarding to what extent the different type of farming units in Peru should receive agricultural extension services. Results are shown in Table 21. This uestion was designed to contrast with the level at which the farming

Table 20. Rank, means and standard deviations of statements regarding the receipt of agricultural extension services as perceived by agricultural development promoters in Peru

Rank	Perception Statements	Valid Cases	Mean	S.D.
Extent agricultural extension services actually received:				
1	Corporate farms	147	3.28	1.39
2	Large individually owned units (more than 21 ha.)	147	2.78	1.22
3	Cooperatives (CAPS, SAIS)	150	2.71	1.14
4	Medium (11 to 20 ha.)	147	2.49	.91
5	Small (4-10 ha.)	151	2.13	.82
6	Minifundista (0 to 3 ha.)	150	1.69	.89

Scale: 5 = Extensive services; 1 = No services

qunits actually received extension assistance shown in Table 20. It is interesting to note that the results in Table 20 and Table 21 have almost an inverse relationship. In Table 21, respondents felt strongly that small farmers with 4 to 10 hectares of land ($\bar{x}$ = 4.59; S.D. = .61), should receive agricultural extension services, but identified the same farmers in Table 20 as actually receiving few services. In the same vein, it was perceived that the minifundistas (0 to 3 ha.) also should receive such services ($\bar{x}$ = 4.51; S.D. = .77) but actually do not ($\bar{x}$ =1.69; S.D. = .89).

Table 21. Rank, means and standard deviations for statements regarding extent farming units should receive agricultural extension services as perceived by agricultural development promoters in Peru

Rank	Item	Valid Cases	Mean	S.D.
Extent agricultural extension services should be received:				
1	Small (4 to 10 ha.)	157	4.59	.61
2	Minifundista (0 to 3 ha.)	156	4.519	.77
3	Medium (11 to 20 ha.)	154	4.16	.91
4	Cooperative (CAPS, SAIS)	149	3.61	1.20
5	Large individually owned units (more than 21 ha.)	146	3.17	1.19
6	Corporate farms	141	2.82	1.33

Scale: 5 = Extensive services; 1 = No services

Members of the population were asked to what extent given factors were obstacles to their institution or department in achieving set objectives in the area of agricultural development. Answers were based upon the Likert-type scale with '5' a severe obstacle and '1' not an obstacle. As not all the factors applied to each member of the population, the option 'not applicable' was added to the scale.

Responses to the question indicate that there was a strong perception that financial resources were an obstacle to institutions in meeting their objectives ($x = 4.49$; S.D. = 1.10). Only 17 respondents

indicated that this factor was not applicable to their institution or department. In addition, the data suggests respondents considered the availability of qualified managers and/or administrators to be somewhat of an obstacle in meeting the objectives of the institutions ($\bar{x}$ = 4.01; S.D. = 1.71). It is important to note that 45 respondents did not believe this factor applied to their organization. Data are presented in Table 22.

In order to understand the perceived limitations to the agricultural extension system in Peru, the respondents were asked to what extent a set of given factors could be considered important limitations to agricultural extension programs. The responses, based upon a five point Likert-type scale with '5' being a strong limitation and '1' not a limitation, are presented in Table 23. The availability of financial support ($\bar{x}$ =4.37; S.D. = .97) ranked first among the potential limitations to agricultural extension programs. This situation is not unlike that of the institutions and departments where the respondents indicated that financial resources were a severe obstacle in Table 22. An additional perceived limitation to agricultural extension programs was the unsafe working conditions for field personnel ($\bar{x}$ = 4.21; S.D. = 1.04).

Table 22. Rank, means and standard deviations regarding obstacles to achieving objectives as perceived by agricultural development promoters in Peru

Rank	Item	Valid Cases	Mean	S.D.	N Not Applicable
Obstacles to achieving objectives in agriculture:					
1	Financial resources	157	4.49	1.10	17
2	Qualified managers and/or administrators	149	4.01	1.71	45
3	Cooperation from governmental institutions	149	3.86	1.49	21
4	Qualified technical assistants	146	3.80	1.61	33
5	Access to clients	144	3.77	1.91	47
6	Infrastructure	150	3.77	1.48	22

5 = A severe obstacle; 1 = Not an obstacle

Table 23. Rank, means and standard deviations of statements regarding limitations to agriculture extension programs as perceived by agricultural development promoters in Peru

Rank	Items	Valid Cases	Mean	S.D.
Limitations to agricultural extension programs:				
1	Availability of financial support	155	4.37	.97
2	Unsafe working conditions for field personnel	160	4.21	1.04
3	Qualified technical personnel	152	3.82	1.23
4	Acceptance of agricultural extension services on behalf of the producers	154	3.66	1.35
5	Coordination among extension agencies	151	3.37	1.31
6	Qualified management personnel	152	2.92	1.28

Scale: 5 = A strong limitation; 1 = Not a limitation

Perceptions of the Role and Limitations of Agricultural Extension Agents

This section is based upon the following specific objectives of this study: (1) to determine the role of agricultural extension education agents in Peru and, (2) to determine the limitations to agricultural extension agents, both as perceived by the agricultural development promoters in Peru. All questions required a response to a five point Likert-type scale with potential answers varying according to the specific question.

The responses to the following questions required a response to a five point Likert-type scale with '5' as strongly agree and '1' signifying strongly disagree.

When asked to what extent selected resources impeded the agricultural extension agent from completing his/her work, the respondents believed that both the lack of transportation ($\bar{x}$ = 4.27, S.D. .92) and the access to new information and technology ($\bar{x}$ = 4.23, S.D. = .87) impede work efforts. Data are presented in Table 24.

Table 24. Rank, means and standard deviations for statements regarding resource impediments to work effort as perceived by agricultural development promoters in Peru

Rank	Item	Valid Cases	Mean	S.D.
Extent resources impede the agricultural extension agents:				
1	Transportation (vehicles)	157	4.27	.92
2	Access to new information and technology	154	4.23	.87
3	Fuel availability	151	3.67	1.18
4	Communication infrastructure	152	3.22	1.17
5	Office materials	150	2.64	1.10

Scale: 5 = Strongly agree; 1 = Strongly disagree

In order to assess the perception of which information dissemination methods should be employed by agricultural extension agents, the

respondents were asked to what extent they agreed with using a variety of teaching and delivery methodologies. The answers were recorded on a scale of '5' strongly agree and '1' strongly disagree and are presented in Table 25. Of the various potential types of dissemination methods, respondents ranked the use of demonstration farms first (x = 4.52; S.D. = .83). Closely following was the use of visits by the extension agent to individual farms (x = 4.31; S.D. = 1.07).

Regarding the information which should be disseminated by agricultural extension agents in Peru, the respondents were asked to

Table 25. Rank, means and standard deviations for statements regarding the extent to which selected delivery methods should be used as perceived by agricultural development promoters

Rank	Item	Valid Cases	Mean	S.D.
Extent the following information dissemination methods should be used by agricultural extension agents:				
1	Use of demonstration farms	159	4.52	.83
2	Visits to individual farms	155	4.31	1.07
3	Nonformal education programs (i.e., workshops, seminars)	149	3.86	1.49
4	Distance education (i.e., radio, television)	159	3.77	1.07
5	Group meetings at extension offices	155	3.28	1.26

Scale: 5 = Strongly agree; 1 = Strongly disagree

identify the importance of selected technical topics. With five out of the possible six responses in this question having a mean of over 4.3, the topics selected were clearly perceived to be important for dissemination by the agricultural extension agents in Peru. Information regarding natural resource conservation measures ranked first with a mean of 4.78 and a standard deviation of .47, closely followed by the proper usage of new agricultural technology ($x = 4.69$; S.D. = .67).

Respondents were asked to identify the level of education they perceived as important for the agricultural extension agents to possess. The responses were recorded via a five point scale of '5' strongly agree and '1' strongly disagree. Respondents ranked non-university technical training in agriculture ($x = 4.07$; S.D. = .94) as more important than a university degree in agriculture ($x = 3.62$; S.D. = 1.20).

Table 26. Rank, means and standard deviations for statements regarding selected technical topics agricultural extension agents should disseminate as perceived by agricultural development promoters in Peru

Rank	Item	Valid Cases	Mean	S.D.
Is it the role of agricultural extension agents to disseminate information regarding:				
1	Natural resource conservation measures	157	4.78	.47
2	Proper usage of new agricultural technology (i.e., seeds, fertilizers, machinery)	160	4.69	.67
3	Marketing advice	158	4.45	.78
4	Sources of agricultural credit	158	4.32	1.02
5	Proper usage of agricultural chemicals (i.e., herbicides, insecticides)	158	4.31	1.11
6	Basic farm management skills (i.e., inventories, accounting)	155	3.89	1.16

Scale: 5 = Very important; 1 = Not important

Table 27. Rank, means and standard deviations for statements regarding training required for extension agents as perceived by agricultural development promoters

Rank	Item	Valid Cases	Mean	S.D.
Extent agricultural extension agents require:				
1	Non-university technical training in agriculture	158	4.07	.94
2	A university degree in agriculture	153	3.62	1.20
3	No formal training but have work experience in agriculture	155	2.57	1.25

Scale: 5 = Strongly agree; 1 = Strongly disagree

Perceptions of the Limitations and Challenges to Agricultural Production in Peru

One of the objectives of this study was to determine the perceptions of the major limitations and challenges to agricultural production in Peru as perceived by agricultural development promoters. This information was considered to be an important part of the study as it serves as a description of the environment in which the respondents, agricultural development promoters, and the agricultural extension agents carry out their daily work.

On a five point Likert-type scale with '5' being a strong limitation and '1' not a limitation, respondents were asked to what extent they

perceived a variety of factors as important limitations to agricultural production in Peru. Data are presented in Table 28. Seven of the sixteen items had a mean score of over 4.0, signifying these factors were considered to be significant limitations to agricultural production. Governmental policies towards agricultural was considered to be the most serious limitation with a mean of 4.74 and a standard deviation of .50. A related factor, low agricultural product prices, ranked as a close second with a mean of 4.74 and a standard deviation of .55. The impact of terrorism in the rural areas on agricultural production was considered to be the third most serious limitation ($\bar{x}$ = 4.30; S.D. = .89), demonstrating the seriousness of this problem to agricultural development in Peru. Available transportation for agricultural products to the marketplace ($\bar{x}$ = 4.29; S.D. = .81) ranked as the fourth most serious limitation with access to agricultural credit ($\bar{x}$ = 4.29; S.D. = .82) ranking as fifth. Available markets for agricultural products (mean 4.28, standard deviation .96) and access to agricultural inputs ($\bar{x}$ = 4.09; S.D. = .90) were also considered to be limitations to agricultural production.

In an effort to identify the most serious limitations to agricultural production in Peru, respondents were asked to identify the three most serious limitations from the alternatives provided in Table 28 and rank them in order of importance from one to three. Furthermore, respondents were asked, in an open ended question, what they

considered to be the solutions to these problems in corresponding order. The majority of respondents did not answer the opened ended portion of the question and of those who did, much of the information was illegible. A qualitative summary of the key points from the answers which were obtained from this open-ended question may be found in Appendix D.

Table 29 summarizes the perceived most serious limitation to agricultural production in Peru in ranking order. As in Table 28, governmental policy towards agricultural, low agricultural prices and the impact of terrorism in the rural areas on agricultural production ranked as the three most serious limitations.

Table 30 and Table 31 summarize what were perceived to be the second and third most serious limitations to agricultural production in Peru.

Table 28. Rank, means and standard deviations for statements regarding limitations to agricultural production as perceived by agricultural development promoters in Peru

Rank	Item	Valid Cases	Mean	S.D.
Extent factors are a important limitation to agricultural production:				
1	Governmental agricultural policies	158	4.74	.50
2	Low agricultural products prices	154	4.74	.55
3	Impact of terrorism in the rural areas	158	4.30	.89
4	Transportation to the marketplace	157	4.29	.81
5	Access to agricultural credit	159	4.29	.82
6	Market for agricultural products	154	4.28	.96
7	Access to agricultural inputs	157	4.09	.90
8	The level of management skills on the part of the agricultural producers	157	3.83	1.11
9	Available storage for agricultural products	153	3.81	1.01
10	Technical agricultural extension services	149	3.81	1.05
11	Acceptance of new agricultural technology	154	3.51	1.08
12	Availability of agricultural mechanization	155	3.52	.89
13	Availability of arable land	152	3.52	1.21
14	The level of formal education on the part of the agricultural producers	156	3.13	1.10
15	The impact of the parcelation of cooperative land holdings	156	3.07	1.31
16	Availability of agricultural workers	155	2.98	1.11

Scale: 5 = Strong limitation; 1 = Not a limitation

Table 29. Rank, frequency and percentages for statements regarding the highest rated limitations to agricultural production as perceived by agricultural development promoters (N = 161)

Rank	Item	Frequency	Percent
Highest rated limitations to agricultural production in Peru			
1	Government agricultural policies	59	36.6
2	Low agricultural prices	49	30.4
3	Impact of terrorism in the rural areas	15	9.3
4	Technical agricultural extension services	9	5.6
5	Access to agricultural credit	6	3.7
6	The level of management skills on the part of the agricultural producers	5	3.1
7	Market for agricultural products	4	2.5
8	Transportation for agricultural products to the marketplace	2	1.2
*9	Access to agricultural inputs	1	.6
*10	The level of formal education of the part of the producers	1	.6
	Not indicated	10	6.2

* Tied for rank order position

Table 30. Rank, frequency and percentages for statements regarding what respondents perceived to be the second most serious limitations to agricultural production in Peru (N = 161)

Rank	Item	Frequency	Percent
Second ranked limitations to agricultural production in Peru			
1	Low agricultural prices	39	24.2
2	Access to agricultural credit	32	19.9
3	Government agricultural policies	16	9.9
4	Impact of terrorism in the rural areas	15	9.3
*5	Transportation for agricultural products to the marketplace	10	6.2
*6	Market for agricultural products	10	6.2
7	Availability of arable land	7	4.3
*8	Access to agricultural inputs	6	3.7
*9	The level of management skills on the part of the agricultural producers	6	3.7
10	The impact of parcelation of agricultural cooperative land holding	5	3.1
*11	The level of formal education on the part of the agricultural producers	3	1.9
*12	Acceptance of new agricultural technology	3	1.9
13	Availability of agricultural mechanization	2	1.2
14	Technical agricultural extension services	1	.6
	Not indicated	6	3.7

* Tied for rank order position

Table 31. Rank, frequency and percentages for statements regarding what respondents perceived to be the third most serious limitations to agricultural production in Peru (N = 161)

Rank	Item	Frequency	Percent
Third ranked limitations to agricultural production in Peru			
1	Market for agricultural products	22	13.7
*2	Access to agricultural credit	21	13.0
*3	The impact of terrorism in the rural areas on agricultural production	21	13.0
4	Low agricultural product prices	19	11.8
5	Government agricultural policies	17	10.6
6	The level of management skill on the part of the producers	7	4.3
7	Access to agricultural inputs	5	3.1
8	Available storage for agricultural products	4	2.5
9	Acceptance of new agricultural technology	3	1.9
10	Availability of arable land	2	1.2
*11	Availability of agricultural mechanization	1	.6
*12	Technical agricultural extension services	1	.6
	Not indicated	11	6.8

* Tied for rank order position

Analysis of Variance

The oneway analysis of variance procedure was utilized to meet with a principle objective of the study: to compare the perceptions of the agricultural development promoters with selected demographic data. The level of significance was set at the .05 level. Differences at the .01 level were reported when found. The Duncan post-hoc test was employed to locate the source of the significant differences.

Oneway analysis of variance tests were utilized with the composite scores from the fifteen questions which used a Likert-type scale (item 1 to item 15). These questions were designed to assess the perceptions of the respondents based upon the objectives of the study. Composite scores for item 1 through item 15 are shown in Table 32. The following independent variables were used with the oneway analysis of variance tests: (1) definition of the institution; (2) objective of the institution; (3) the number of years the institution or department has been active in agriculture; (4) the highest educational level attained by the respondents; (5) age of the respondents, and (6) years of work experience of the respondents.

The gender of the respondents was not used as an independent variable for either the oneway or twoway analysis of variance as the overwhelming majority (141 or 91.3%) were male. In addition, the variable which reflected the number of people working in the institutions or departments where the respondents were employed was not used for either analysis of variance as sixty (37.3%) of the

respondents did not answer this question. Items number 1, 2, 9, 10, 11, 12, 13, 14 and 15 included an open space "other" designed for respondents to fill in comments. As very few comments were received and of those that were, the majority were either not in a complete

Table 32. Composite scores of item 1 to item 15

Item	Topic	Valid Cases	Score	S.D.
1	Cost of extension services	159	3.13	.80
2	Resources which impede extension agents	159	3.64	.68
3	Producer efficiency in production	155	3.36	.61
4	Actual receipt of extension services	155	2.54	.79
5	Producer efficiency in management	152	3.19	.65
6	Need for extension services	160	3.88	.67
7	Extension policy statements	161	3.61	.38
8	Coordination between groups	157	4.13	.48
9	Responsibility for coordination	159	3.22	.76
10	Obstacles to institutions	157	3.99	1.13
11	Dissemination methods	160	3.99	.60
12	Qualifications of extension agents	159	3.46	.64
13	Limitations to extension programs	160	3.78	.73
14	Information to be disseminated	161	4.41	.53
15	Limitations to agricultural production	161	3.90	.46

sentence nor legible, these data were not included in the analysis.

Definition of the institutions

Utilizing the oneway analysis of variance program, the composite scores for the items 1 through 15 were compared with the definition of the institutions in the study. Respondents were asked to define their institutions, limiting their selection to either (1) a private organization (belonging to the private sector); (2) a public organization (belonging to the public sector) or, (3) an international organization (member of an international organization). A significant difference ($p < .05$) was found with item 4, the extent to which agricultural extension services are actually received by different farming units. Data are presented in Table 33. The Duncan post-hoc test revealed that both group 1 (private) and group 2 (public) respondents rated the level of services actually received significantly higher than the respondents in group 3 (international).

Objective of the institutions

Respondents were grouped according to the principle objective of the institution in which they worked, either (1) research; (2) education; (3) administration or, (4) coordination. When the four groups were compared with the composite scores of item 1 through item 15, no significant differences were found at the .05 level. Data are shown in Table 34.

Table 33. Analysis of variance in item 1 to 15 when agricultural development promoters in Peru were grouped by type of institutions (public, private or international)

	Definition of the Institution[a]									
	Group 1			Group 2			Group 3			
Item	N	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	F-ratio
1	94	3.16	.84	43	3.07	.68	21	3.12	.79	.34
2	96	3.59	.63	42	3.76	.70	20	3.67	.81	.98
3	95	3.34	.60	38	3.39	.71	21	3.45	.61	.91
4	94	2.60	.86	39	2.55	.76	21	2.35	.74	.94
5	93	3.24	.64	37	3.26	.58	21	2.79	.75	4.63*
6	96	3.89	.67	42	3.92	.65	21	3.78	.68	.36
7	96	3.59	.39	43	3.70	.35	21	3.54	.40	1.76
8	94	4.12	.52	42	4.19	.38	20	4.00	.48	1.16
9	94	3.20	.78	43	3.36	.78	21	3.03	.62	1.34
10	94	3.87	1.17	42	4.17	1.05	20	4.22	1.11	1.50
11	96	4.02	.56	43	4.00	.66	20	3.99	.60	.87
12	96	3.49	.65	41	3.40	.53	21	3.38	.77	.47
13	96	3.71	.80	43	3.87	.58	20	3.91	.66	1.04
14	96	4.37	.54	43	4.50	.51	21	4.44	.52	.91
15	96	3.81	.51	43	4.01	.40	21	3.90	.46	1.76

[a] Group 1 = Private (belonging to the private sector)
Group 2 = Public (belonging to the public sector)
Group 3 = International (member of an international organization)

Table 34. Analysis of variance in item 1 through item 15 when agricultural development promoters in Peru were grouped by the principle objective of the institutions (research, education, administration or coordination)

	Objective of the institution[a]												
	Group 1			Group 2			Group 3			Group 4			
Item	N	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	F-ratio
1	32	3.07	.81	48	3.01	.65	15	2.87	.73	53	3.23	.85	1.13
2	32	3.63	.80	49	3.62	.63	14	3.91	.68	53	3.54	.64	1.10
3	30	3.39	.72	48	3.24	.59	14	3.47	.53	52	3.32	.60	.68
4	31	2.53	.71	49	2.55	.69	14	2.46	.73	50	2.50	.76	.06
5	28	3.21	.70	47	3.14	.67	14	3.37	.65	52	3.08	.58	.80
6	31	3.90	.66	49	3.79	.53	15	3.69	.79	54	3.96	.66	.95
7	32	3.72	.40	49	3.59	.37	15	3.58	.40	54	3.58	.36	1.13
8	31	4.12	.48	48	4.07	.45	15	4.18	.55	53	4.16	.45	.40
9	31	3.29	.83	49	3.11	.68	15	3.24	.84	53	3.22	.74	.41
10	32	4.09	1.23	48	3.94	1.24	15	3.68	1.11	51	4.08	1.16	.58
11	32	3.93	.58	49	3.99	.59	15	4.12	.57	53	3.90	.58	.63
12	31	3.40	.61	48	3.36	.54	15	3.67	.52	54	3.51	.73	1.19
13	32	3.55	.83	49	3.87	.63	15	3.84	.62	53	3.75	.78	1.33
14	32	4.54	.50	49	4.35	.57	15	4.58	.42	54	4.39	.53	1.32
15	32	3.94	.43	49	3.93	.38	15	3.98	.48	54	3.89	.47	.99

[a] Group 1 = Research
Group 2 = Education
Group 3 = Administration
Group 4 = Coordination

Number of years active in agriculture

Respondents were asked to provide data regarding the numbers of years the institution or, if more appropriate, the department in which they worked has been active in the area of agriculture. To facilitate data analysis, the raw data were grouped into the following three categories: (1) 9 years or less; (2) 10 to 19 years and, (3) 20 or more years active in the area of agriculture. An oneway analysis of variance utilizing this information with the composite scores of the perception statements (items 1 through 15) yielded a significant difference for item 14. Data are shown in Table 35. The Duncan post-hoc test showed the difference to lie between the respondents of the institutions which were active in the area of agriculture for less than 9 years and the group that had been active for 20 years or more in regards to the type of information which should be disseminated by agricultural extension agents. The respondents which worked in institutions that had been active in the area of agriculture for 20 years or more more rated the importance of information dissemination for various topics higher than did the respondents who worked in institutions which had been active in agriculture for 9 years or less.

Level of education

Data concerning the highest level of education earned by the respondents were gathered using the following categories: (1) high school; (2) technical studies; (3) bachelors degree; (4) masters degree

and, (5) doctorate degree. One respondent utilized the space allotted for 'other', answering primary school. The data were recoded to facilitate the data analysis process into the following categories: (1) "less than university level education" which included the high school and technical school levels as well as the one respondent with a primary school level education; (2) bachelors degree; (3) masters degree and, (4) doctorate degree. Data utilizing these four categories are presented in Table 36.

Item one, who should bear the cost of agricultural extension services in Peru, was significant at the .05 level. The Duncan post-hoc test showed the differences as located between the group with the least education (primary school, high school and technical school) versus the three other groups which all have universities degrees at differing levels. The extent farming units are efficient in agricultural production (item 3) was viewed differently between the respondents with a doctorate degree and those with a bachelors degree or without a university degree. The respondents with a doctorate degree viewed the farmers as being significantly less efficient in agricultural production than did the other two groups mentioned. In addition, the extent to which agricultural producers of differing types are seen as efficient in management varied between the non-university degree respondents and those respondents with a masters degree. The non-university degree respondents perceived the management of the different types of agricultural production units to be more efficient than did the

Table 35. Analysis of variance in items 1 through 15 when agricultural development promoters in Peru were grouped by the number of years the institutions or departments in which they were employed had been active in the area of agriculture

	Number of years institution active in agriculture[a]									
	Group 1			Group 2			Group 3			
Item	N	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	F-ratio
1	61	3.05	.77	35	3.37	.89	49	3.07	.79	2.06
2	61	3.53	.64	34	3.60	.72	50	3.72	.62	.95
3	63	3.33	.54	35	3.35	.66	45	3.27	.64	.18
4	62	2.54	.73	33	2.70	.90	47	2.42	.74	1.34
5	61	3.20	.71	34	3.28	.60	44	3.04	.58	1.37
6	62	3.80	.62	35	4.01	.71	49	3.88	.67	1.02
7	62	4.12	.51	34	4.03	.46	48	4.12	.47	.68
8	62	3.78	1.13	34	4.03	.99	48	4.18	1.24	1.68
9	62	3.17	.72	33	3.39	.82	50	3.26	.77	.91
10	62	3.78	1.13	34	4.03	.99	48	4.18	1.20	1.68
11	62	3.91	.58	35	4.08	.67	49	4.01	.67	.96
12	61	3.42	.56	35	3.63	.79	50	3.44	.62	1.38
13	62	3.68	.67	35	3.84	.83	49	3.97	.71	2.34*
14	62	4.41	.51	35	4.29	.55	50	4.51	.48	1.91
15	62	3.86	.48	35	3.80	.48	50	3.98	.45	1.50

[a] Group 1 = 9 years or less
Group 2 = 10 to 19 years
Group 3 = 20 years or more

Table 36. Analysis of variance in item 1 through item 15 when agricultural development promoters in Peru were grouped by the highest level of education attained

	Level of Education Obtained[a]												
	Group 1			Group 2			Group 3			Group 4			
Item	N	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	F-ratio
1	8	4.03	.82	85	3.12	.78	41	2.97	.68	19	3.05	.89	4.25*
2	8	3.84	.60	85	3.61	.67	41	3.60	.55	19	3.84	.88	.89
3	8	3.59	.87	83	3.41	.55	38	3.34	.40	20	3.06	.83	2.33*
4	8	2.75	.70	81	2.62	.83	40	2.49	.71	20	2.23	.78	1.59
5	8	3.57	.58	83	3.25	.67	37	3.02	.48	18	3.09	.75	2.21*
6	8	4.00	.85	86	3.96	.68	40	3.76	.63	20	3.75	.57	1.26
7	8	3.62	.52	86	3.66	.40	41	3.53	.36	20	3.58	.35	1.04
8	8	4.37	.40	85	4.11	.49	39	4.11	.50	19	4.04	.44	.92
9	8	3.79	.95	85	3.13	.70	40	3.24	.84	20	3.34	.74	1.72
10	8	3.77	.84	84	3.97	1.07	40	3.96	1.24	19	4.44	1.27	1.08
11	8	4.03	.64	85	4.05	.56	41	3.86	.58	20	4.00	.73	.93
12	8	3.75	.93	85	3.48	.62	41	3.43	.56	19	3.25	.73	1.25
13	8	4.18	.66	86	3.66	.79	40	3.85	.59	20	4.00	.62	2.31
14	8	4.33	.46	86	4.41	.54	41	4.51	.45	20	4.36	.58	.62
15	8	4.01	.51	86	3.88	.53	41	3.84	.31	20	3.99	.47	.62

[a] Group 1 = Less than university level education
Group 2 = Bachelors degree
Group 3 = Masters degree
Group 4 = Doctorate

respondents with masters degrees.

Age

Data concerning the age of the respondents were collected in raw form and, to facilitate analysis, were placed into the following groups: (1) up to age 34; (2) age 35 to 44; (3) age 45 to age 54 and, (4) 55 years of age or older. Significant differences were found with four items and the Duncan post-hoc test was employed to determine where the differences were located. For item four, the extent to which different types of farming units actually receive agricultural extension services, the different perceptions were between the age group 55 and older and the other three age groups. The older age group believed the different types of farming units to actually receive less services than did the other three groups.

The extent to which the various age groups agreed with selected macro-level policy statements pertaining to agricultural extension (item 7) was found to be significantly different between the age group 55 and older and the 45 to 54 age group as well as the respondents which were 34 years of age or less. The 55 years and older age group agreed less with the policy statements than did the other two groups. Regarding the level of coordination that existed between different groups that support agricultural development in Peru (item 8), the respondents which were between 35 and 44 years of age agreed less strongly with the statements than did the older group, age 55 or older, and the

younger group, 34 years or younger. Finally, the Duncan post-hoc test revealed that the significant difference found in item 15, limitations to agricultural production, were between those 35 to 44 years of age and the two older groups, ages 45 to 54 and over 55 years of age. Data are shown in Table 37.

Number of years of work experience

Five significant differences at the .05 level were found when the analysis of variance program was run with the composite scores of items 1 through 15 with the number of years respondents had worked in the area of agriculture. The raw data collected was grouped into four categories: (1) 9 years or less of work experience in agriculture; (2) 10 to 19 years; (3) 20 to 29 years and, (4) 30 years or more. Results are shown in Table 38.

The Duncan post-hoc test indicated that with item one, who should bear the cost of agricultural extension services, the differences were between respondents with less than nine years of work experience in agriculture and those with 30 or more years of work experience. Item two, resources which impede the extension agents from completing his/her work, was also found to be significant at the .05 level. Respondents which had 30 years or more work experience in the area of agriculture perceived the limitations to the extension agent to be greater than those with nine years or less of work experience.

Table 37. Analysis of variance in item 1 through item 15 when agricultural development promoters in Peru were grouped by different age groups

	Age Group[a]												
	Group 1			Group 2			Group 3			Group 4			
Item	N	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	F-ratio
1	33	2.89	.52	46	3.13	.87	43	3.14	.66	29	3.25	1.02	1.16
2	32	3.67	.63	46	3.48	.70	43	3.67	.57	30	3.76	.72	1.27
3	33	3.34	.71	45	3.32	.59	39	3.42	.42	30	3.24	.70	.51
4	33	2.83	.60	47	2.58	.84	38	2.47	.80	29	2.10	.70	4.99*
5	32	3.34	.69	43	3.23	.70	39	3.09	.47	30	3.08	.65	1.29
6	33	3.90	.60	46	3.93	.64	43	3.89	.68	30	3.70	.72	.81
7	33	3.70	.25	47	3.58	.33	43	3.69	.43	30	3.42	.40	4.27*
8	31	4.21	.38	46	3.96	.57	43	4.15	.45	29	4.20	.48	2.58*
9	33	3.11	.63	46	3.12	.86	43	3.33	.73	29	3.28	.74	.89
10	33	3.83	1.16	45	4.23	1.15	43	3.91	.98	28	3.96	1.33	.98
11	33	4.09	.52	47	3.98	.58	43	4.05	.59	30	3.83	.68	1.21
12	33	3.37	.49	47	3.46	.73	42	3.49	.57	29	3.38	.61	.33
13	33	3.73	.69	47	3.63	.77	43	3.92	.74	29	3.84	.60	1.34
14	33	4.51	.47	47	4.32	.52	43	4.45	.47	30	4.44	.58	.91
15	33	3.90	.52	47	3.74	.44	43	3.99	.44	30	3.97	.46	2.64*

[a] Group 1 = 34 years or younger
Group 2 = Age 35 to 44
Group 3 = Age 45 to 54
Group 4 = 55 years of age or older

Regarding the level of agricultural extension services actually received by the different types of farming units in Peru (item 4), the respondents with over 30 years of work experience in the area of agriculture perceived the levels of services actually received to be significantly lower than the other three groups of respondents. When asked which different types of farming units should receive agricultural extension services, those respondents which had between 10 and 19 years of work experience in agriculture differed significantly from those respondents with over 30 years of experience. The former respondents (10 to 19 years of experience) rated the level of extension services which should be delivered to farmers higher than did the respondents with over 30 years of work experience in the area of agriculture.

The number of years the respondents worked in the area of agriculture was also found to significantly affect the perception of the factors that were limitations to agricultural extension programs in Peru (item 13). The respondents with between 10 and 19 years of experience in agriculture perceived selected factors to be less of a limitation to agricultural extension programs than did the two groups with more years of experience (20 to 29 years and 30 years or more).

Table 38. Analysis of variance in item 1 through item 15 when agricultural development promoters in Peru were grouped according to the number of years of work experience in agriculture

	Age Group[a]												
	Group 1			Group 2			Group 3			Group 4			
Item	N	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	N	Mean	S.D.	F-ratio
1	36	2.80	.43	43	3.22	.91	35	3.40	.79	34	3.06	.84	3.97*
2	35	3.44	.57	44	3.60	.72	35	3.69	.61	34	3.83	.66	2.17*
3	36	3.27	.61	43	3.311	.64	33	3.31	.48	32	3.36	.65	.11
4	36	2.75	.59	44	2.56	.83	33	2.63	.74	31	1.99	.66	6.88*
5	35	3.19	.64	42	3.28	.73	32	3.09	.59	32	2.99	.50	1.42
6	36	3.91	.53	44	4.04	.78	35	3.74	.78	35	3.70	.64	2.26*
7	36	3.57	.36	45	3.60	.36	35	3.68	.34	34	3.57	.45	.68
8	35	4.08	.47	44	4.06	.50	35	4.19	.44	33	4.18	.49	.70
9	36	3.02	.62	45	3.24	.92	34	3.32	.69	33	3.27	.69	1.01
10	35	3.90	1.19	45	4.23	1.22	34	3.86	.95	32	3.93	1.16	.87
11	36	4.06	.53	45	4.05	.63	34	4.04	.49	34	3.80	.69	1.54
12	36	3.36	.54	45	3.56	.69	35	3.54	.68	32	3.33	.56	1.28
13	36	3.68	.80	45	3.57	.80	35	4.02	.53	33	3.93	.60	3.30*
14	36	4.51	.48	45	4.32	.51	35	4.35	.53	34	4.54	.51	1.78
15	36	3.83	.59	45	3.84	.38	35	3.91	.42	34	3.99	.48	.91

[a] Group 1 = 9 years or less
Group 2 = 10 to 19 years
Group 3 = 20 to 29 years
Group 4 = 30 years or more

CHAPTER V. DISCUSSION

The main purposes of this study were to develop a comprehensive profile of the institutions which promote agricultural development in the South American country of Peru and to provide baseline data on the status of the agricultural extension system as a foundation for future related research. An additional purpose was to determine the needs and limitations of the agricultural extension system as perceived by individuals who were directly involved in promoting the development of the agricultural sector in Peru.

The discussion of the data will be presented by research objectives in the following order: (1) discussion of the demographic characteristics of the respondents; (2) discussion of the profile of the institutions; (3) discussion of the needs and limitations of the agricultural extension system in Peru as perceived by the respondents; (4) discussion of the role and limitations of agricultural extension agents in Peru as perceived by the respondents; (5) discussion of the challenges and limitations to agricultural production in Peru as perceived by the respondents and, (6) discussion of the comparison of perceptions with selected demographic variables.

Comprehensive Profile of the Agricultural Extension System in Peru

Demographic characteristics

In order to fully understand the nature of the agricultural extension system in Peru, it is necessary to develop a profile of the individuals who promote agricultural extension. For the purposes of this study, individuals who work with institutions (i.e., the Ministry of Agriculture, agrarian universities, international development agencies, private research and extension agencies) which have the development of the of the Peruvian agricultural sector as a primary operational goal, are referred to as agricultural development promoters.

As indicated in Figure 1, the majority of the respondents were male (91.3%). As agricultural is a traditionally male dominated field in Latin America, this high percentage of males was not unexpected. The age of the respondents was well distributed with the percentages between the four age groups not varying over 10.5%. No one age group greatly exceeded another in size. Not surprisingly, 91.9% of the respondents were from Peru but it is interesting to note that of the respondents with different nationalities, no two were from the same country. It might have been expected that one country would predominate in the number of foreign agricultural development workers but that was not the case.

The high level of education of the respondents is noteworthy. A full 91% had a college or university education with 37.9% holding a graduate

degree. These figures portray agricultural development workers as qualified, motivated individuals. To further this premise, 37.9% of the respondents achieved their highest degree by studying internationally with 21 of the degrees coming from Europe and another 21 from the United States. It is probable that the majority of those respondents who studied internationally received scholarships to do so, again reinforcing the premise that the agricultural development promoters who made up the respondents of this study were highly qualified professionals.

The respondents were fairly equal in regards to the years of experience they had working in the area of agriculture. When asked to identify their job responsibilities from a pre-established list which was not mutually exclusive, it was found that the respondents most frequently identified themselves as being an advisor for at least a portion of their time (n = 67). It must be noted that the term in Spanish for advisor, "*asesor*", has a slightly different connotation than it does in English. In Spanish, this term is used in a broader sense than in English and as a result is more inclusive. Those respondents who identified themselves as advisors may be so in either technical or non-technical subject matter areas. A full 114 of the respondents stated they were either managers or administrators. Only 9.3% indicated they were technicians, that is to say, only this small percent of the respondents worked directly in the more technical aspects of agricultural development.

Institutional profile

One of the main purposes of this study was to develop a comprehensive profile of the agricultural extension system in Peru. A specific objective was to develop a comprehensive profile of organizations which were involved in the promotion of agricultural extension in Peru. To accomplish these goals, it is necessary to develop a descriptive profile of not only the individuals who work for the institutions, but also the institutions and departments themselves.

A key point to this research study was to identify the specific type of institutions which promote agricultural development in Peru. Respondents were asked to define the institution or department of which they were members. Almost 60% of the respondents identified their institution as pertaining to the private sector, nearly 27% as being part of the public sector and 21% as part of an international organization. The low number of public institutions was somewhat surprising when it is taken into consideration that this category consisted of all government institutions including the Ministry of Agriculture. An explanation for the predominance of private institutions and the low number of public institutions may be the failing economy of Peru and the falling level of income of the government due to the growth of the informal sector of the economy. These statistics support the theory that with less public funding available, the agricultural development promoters in the private sector have expanded their presence to fill the void.

When identifying the principle objective of their institution, 33.5% of the respondents selected coordination. Coordination also has a slightly different connotation in Spanish than it does in English. *Coordinación* may include some aspects of management as well as activities generally thought of as falling under the heading of support services. It is a broad term which implies the institutions in this category are multifaceted. Not surprisingly, over 30% of the institutions were considered to work primarily in the area of education. This objective includes the dissemination of information in both formal and non-formal settings and therefore may include extension activities. The low number of respondents who identified the primary objective of their institution as administration (9.3%) was not anticipated. It is thought that this figure may be skewed due to the percentage of the population who selected coordination as the principle objective.

Respondents identified the principle source of funding for their institutions or departments as coming from international organizations (50.3). This was surprising given the small number of respondents who identified their institutions as being a member of an international organization (13%). Clearly, many of the private institutions which promote agricultural development in Peru rely on international funding. Another point of interest is that although only 26.7% of the respondents perceived their institutions to be part of the public sector, over 40% identified the Peruvian government as a source of funding. When asked to

describe the type of funding received by the institution (i.e., donations, funds generated from service to clients or loans), the resulting information corresponded with the perceived source of funding. Donations were identified as the principle type of funding by over 53% of the respondents. As international organizations often provide support for institution via donations, these data are in line with the statement that international organizations are the principle source of funding. Service to clients ranked second both as a source of funding (44.2%) and as the principle type of funding (34.2%).

From a list of seven potential activities in which the institutions may have been involved, all seven were identified by 50 or more respondents. As the activities were not mutually exclusive, respondents were free to select more than one area in which their institutions were active. A total of 412 activities were selected by the respondents. These data indicate that the majority of institutions were working in various activity areas at the same time. When asked to identify the clients to which the services of the institutions were extended, the 140 respondents who answered this question made 563 selections. Clearly, not only did the institutions represented by respondents in the study have multiple on-going activities, but they had a diverse client base as well. These data are supported by Larios (1989) when he described the agricultural producers in Peru as being primarily a heterogeneous population (Larios, 1989).

In an effort to identify the size of the institutions represented in the study, respondents were asked how many people worked either in the institution or, if more appropriate, in the department in which they were employed. While over 37% of respondents did not answer this question, of those who did, almost 30% worked in organizations with over 10 employees while just over 30% did so in organizations of 10 employees or less. With the answers to this question ranging from a minimum of one to a maximum of 80, it is not possible to draw a strong conclusion regarding the average size of the institutions or departments from these data.

In order to identify the activity level of the institutions or departments, respondents were asked to answer several questions regarding on-going and past projects activity. The number of agricultural projects in the planning or proposal stages ranged from zero to 45 with a total of 434 projects falling into this category. The majority (76%) of the 106 individuals who answered this question identified their institutions as having between one and five projects in the planning or proposal stage. In regards to the number of projects which were either on-going or had been undertaken in the previous five years, the range was from zero to fifty, with the majority (75%) of the respondents identifying between one and six projects as falling into this category. The total number of projects identified as either on-going or completed in the past five years was 568.

In order to ascertain the number of institutions in this study which included agricultural extension in their project activities, respondents

were asked to identify how many of the projects that were either in the planning or proposal stage, or were on-going or had been undertaken in the previous five years, included an agricultural extension component. The majority of the respondents (70%) identified their institutions as having between one and six such projects with an agricultural extension component. The total number of projects identified as including agricultural extension was 531. When considering the total number of projects in the planning or proposal stage (n = 434) or either on-going or completed in the past five years (n = 569) equaled a total of 1,002 identified projects and, of these, 531 included an agricultural extension component, it may be concluded that over 50% of all projects included extension activities.

The respondents were asked how many of the projects in the planning or proposal stage or which were either on-going at the time of the study or had been completed in the previous five years had been conducted in coordination with another institution. The response to this question indicated that 411 such projects had been conducted with in coordination with another institution, which computes to 41%. While the increased level of coordination is desirable in order to more efficiently utilize resources and to avoid duplication of effort, it is encouraging to note that over 40% of projects have been or will be conducted in a cooperative effort. It is important to note that 91 respondents (n = 161) indicated the institution with which they were employed was either involved with one

or more projects in the rural areas of Peru or had been in the past five years.

Perceptions of the Needs and Limitations of the Agricultural Extension System in Peru

The main purpose of this study involved the development of a comprehensive profile of the agricultural extension system in Peru as well as to determine the needs and limitations of the agricultural extension system as perceived by agricultural development promoters in Peru. In meeting with these goals, respondents were asked to share their perceptions regarding issues fundamental to agricultural extension.

On the issue of who should bear the cost of agricultural extension services, respondents supported the idea of services being provided by a coordinated effort between the government of Peru, universities, businesses and private and international organizations. Respondents also supported the alternative of the client paying according to his or her capabilities with the government of Peru subsidizing the effort. Respondents did not support the statement that services should be provided 100% by the Peruvian government.

Respondents perceived the development of the agricultural sector as being absolutely critical to solving the economic crisis in Peru. The overwhelming agreement with this statement indicates the importance of the agriculture sector to the Peruvian economy. Respondents also showed

extremely strong support of agricultural extension in the extent to which they agreed that improving the agricultural extension system in Peru should be a priority for future governments. This finding supports Cevallos belief that increasingly support exists for extension programs (Cevallos, 1989). Further support for extension was demonstrated as the respondents strongly agreed that, in theory, agricultural extension services increase agricultural production. With this statement in mind, respondents disagreed that in reality, agricultural extension services actually increase agricultural production in Peru. With these few statements respondents demonstrated their belief in and support of agricultural extension. They also made a clear statement that while agricultural extension has the potential to increase production and to make a significant contribution to the economy, this does not occur in Peru.

Respondents perceived coordination among agricultural development promoters as being very important. This finding is in agreement with Ccama (1987) when he cited the importance of increased coordination based upon the results of the ENAHR study (Ccama, 1987). There was strong agreement that increasing coordination would result in improved services to agricultural producers as well as improving the work of the respondents themselves. In addition, there was strong agreement on behalf of the respondents that there should be one main center for the coordination of agricultural extension activities in Peru. This is an

important statement to note as it goes against the current trend towards the diversification of extension service providers due to the wide-spread economic restrictions.

In regards to who should be responsible for the coordination of agricultural extension services, respondents strongly agreed extension should be coordinated in a joint effort by the government, universities, non-governmental organizations and representatives from the private sector. Respondents did not support the premise that the government should be solely responsible for the coordination effort. These statements indicate a break with the traditional model of governments being primarily responsible for the coordination and implementation of agricultural extension.

There was a parallel in the perceptions of the level of efficiency of management and agricultural production in regards to the different types of production units. In both management and agricultural production efficiency, respondents viewed the corporate farms as being quite efficient with the large individually farms as being somewhat less so. The minifundistas were perceived as being somewhat inefficient in both production and management. It is interesting to note that the perceptions regarding the levels of efficiency in management and production have, with the exception of the cooperative farming units, a direct relationship with the amount of land held by the producer. The larger the landholding, the higher the level of efficiency was perceived to

be in both management and production. As current statistics regarding efficiency by unit size is nonexistent, it is difficult to ascertain if this perception is based on reality or on the myth of efficiency of the pre-land reform era haciendas. It is interesting to note that the respondents shared the viewpoint of the president of the National Agrarian Bank, Ing. Fuentes Barriga, who indicated his belief that bigger is better when he stated that the small land holders are one of the largest problems facing agricultural development in Peru (El Comerico, July 25, 1989).

Respondents were asked two contrasting questions regarding the level of agricultural extension services received by the different types of production units. First, the respondents were asked to what extent agricultural extension services were actually received by the different production units, secondly, respondents were asked to what extent the production units should receive agricultural extension services. Interestingly, the responses to the two questions were almost the exact inverse of each other. It was perceived that the corporate farms actually received the most extensive agricultural extension services of all the unit types, but that the same corporate farms should actually receive the least amount of services. The respondents believed the minifundistas actually received the least amount of extension services of the different farming units but stated that they should receive extensive services. The contention that the level of agricultural extension services should be increased to the smaller land owners is in accordance with the report on

the status of agricultural extension in Peru, issued by the International Service for National Agricultural Research (ISNAR, 1985).

It is important to recognize that when asked the extent to which the different production units actually received agricultural extension services, only the corporate farms received a rating of above 3, meaning that the respondents perceived that only the corporate farms received extensive services. These responses indicate that the level of extension service to the different farming units in Peru is quite low with the exception of the corporate farms. This higher level of extension service to the corporate farm may be due to their ability to afford private extension services or it maybe that in some cases, extension services may be provided by the buyer of the agricultural product in an effort to ensure adequate supply. The low level of agricultural extension services in Peru is evidenced by the ENAHR study which revealed only 3.6% of agricultural producers in Peru received technical assistance in 1983-1984 (Ccama, 1987).

It is important to understand what the respondents perceived to be the major obstacles to their institutions in achieving their work objectives. As was anticipated, financial resources were perceived to be the number one obstacle to the institutions. The lack of qualified managers and/or administrators was also perceived as somewhat of an obstacle, as was the receipt of cooperation from government institutions. With 5 defined as a severe obstacle, it is significant that all six of the possible selections

within this question had a mean of above 3.75. From these data it may be concluded that all six items were considered to be an obstacle by the respondents, indicating that the environment in which the institutions operate poses multiple challenges to the successful completion of work objectives.

When asked to what extent a series of factors were limitations to agricultural extension programs in Peru, again the strongest limitation was perceived to be the availability of financial resources. The second ranked selection, unsafe working conditions for extension field personnel, indicates the extent of the impact terrorism has had on agricultural extension activities. The availability of qualified technical personnel was perceived to be somewhat of a limitation. It may be theorized that these top three ranking items are interrelated. The lack of qualified field personnel may be due, in part, to the top two ranked items: the lack of financial resources and the unsafe working conditions for field personnel. This perceived lack of qualified personnel is important to note as the success of a extension program is largely based upon the quality the extension agents (Pontificia Universidad Catholica de Chile, 1985).

A final perceived limitation was the acceptance of agricultural extension services on behalf of the agricultural producers. This finding is not surprising given the findings of the ENAHR national study which revealed that nationally, 19.2% of agricultural producers do not accept the advice of the extension agent. This percentage is higher in the *sierra*

region (Ccama, 1987).

Perceptions of the Role and Limitations of the Agricultural Extension Agent in Peru

Two specific objectives of this study were to determine the role of agricultural extension agents in Peru as well as to determine their limitations as perceived by individuals who were defined as agricultural development promoters. To achieve these objectives respondents were asked a serious of questions regarding their perceptions of agricultural extension agents.

Respondents indicated the extent of their agreement regarding selected resources which may impede extension agents from completing their work assignments. The lack of transportation (vehicles) was perceived to be the number one impediment. This finding supports the previous statements which indicated that the lack of financial resources was perceived to be the number one limitation to both institutions and agricultural extension programs. The second ranked impediment to agricultural extension agents was the access to new technology. Insufficient technology is considered to be a major hindrance to agricultural development in Peru (Pomareda Benel, 1985).

The use of demonstration farms was the preferred method for information dissemination by the respondents. Visits to individuals farms, non-formal educational programs, distance education programs and group

meetings were also viewed favorably. The positive response to all suggested methods of information dissemination indicates an open mind towards information delivery techniques and the use of different methodologies on behalf of the respondents.

In regards to the content of the information to be disseminated, surprisingly, the topic of natural resource conservation measures was ranked number one. Due to the many other critical problems facing agriculture in Peru, this result was not anticipated. The high level of education attained by the respondents may explain their increased awareness of the need for natural resources conservation methods and thus the response to this question. The proper usage of new agricultural technology was also perceived as very important by the respondents, as was the dissemination of marketing advice, sources of agricultural credit and the proper usage of agricultural chemicals. All of the above items were rated above 4.3 on a scale where 5 was defined as very important. This fact in itself is important. It is clear that the respondents perceived the role of the agricultural extension agent to be quite diverse when considering the topics of the highly ranked items range from conservation issues to the marketing and banking system to the use of pesticides and machinery. Based upon the responses, it may be concluded that extension agents in Peru are not expected to only disseminate information regarding the technical aspects of agricultural production, but have a much more diverse role to fulfill.

In regards to the education and/or training required by agricultural extension agents in order to be perceived as qualified, non-university technical training was deemed to be preferable to a university degree in agriculture. This response may be interpreted to be both a statement of support of the practical learning experience as well as an implied lack of support for the educational programs of the national agrarian university in Peru. Respondents did not support the option that extension agents have no formal training but have work experience in agriculture.

Perceptions of the Limitations and Challenges to Agricultural Production in Peru

A key specific objective of this study was to identify the most important limitations and challenges that face agricultural production in Peru as perceived by agricultural development promoters. In order to achieve this objective, on a five point scale respondents were asked to stated whether they strongly agreed/disagreed with a series of sixteen items. In many instances, the means of the items were very similar, resulting in several close rankings. Governmental policy towards agriculture and low agricultural product prices were both perceived to be very strong limitations with means of 4.74. These two items are closely interrelated as the government of Peru has, to a large extent, set the price of fundamental food items over the past several years. This price control policy, which had been implemented in an attempt to control the

hyper-inflation which is found in Peru, did not address the real cost of production to the farmer. The negative impact of governmental macroeconomic policies on the agricultural sector in Peru is also considered to be the most important limitation to agricultural development by Larios (Larios, 1989). The importance of available fair market prices in contributing to overall agricultural development is emphasized by the Catholic University of Chile (Pontificia Universidad Catholica de Chile, 1985).

Ranked third, the impact of terrorism in the rural areas is perceived to be a strong limitation to agricultural production in Peru. This impact is double fold, not only does it limit the movements and effectiveness of the agricultural extension agent, but it also is a major factor contributing to the massive urban migration which has occurred in Peru in recent years, distancing farmers from their lands. The terrorism virtually prohibits any research from being conducted in the rural areas. It also strongly discourages group meetings and many of the activities of extension. In addition, the terrorism disrupts marketing procedures, usually by the destruction of roads and bridges to the principle market outlets, but also by robbery and intimidation. The result of the lost marketing opportunities may be the restriction of product movement and the flooding of the local market with a particular product, resulting in low product prices. It may be theorized that the impact of terrorism may influence the agricultural producers who remain in the rural areas away

from farming for a market economy and towards subsistence agriculture.

The following three items were perceived to be equal limitations to agricultural production: (1) transportation to the marketplace; (2) access to agricultural credit and, (3) available market for agricultural products. Again, these issues are closely interrelated. With a lack of markets, longer distances must be covered to reach the markets which are available, requiring transportation which is more often than not either unavailable or prohibitively expensive. Access to agricultural credit, while limiting the entire chain of activities involved in agricultural production, also limits the marketing radius of a producer by limiting the finances available to pay for product transportation to the marketplace. As only a very low percentage (7.5%) of agricultural producers in Peru received credit in 1983-1984, it is not surprising the respondents perceived access to agricultural credit as one of the leading limitations to agricultural production (Ccama, 1987).

Respondents perceived the access to agricultural inputs as somewhat of a limitation to agricultural production. Again, this may be related to the previous items mentioned including transportation and access to the marketplace. Access may be defined as not only physical access, but also financial. The lack of credit and low agricultural prices result in the inability of producers to purchase needed inputs, therefore limiting their access to agricultural inputs. Again, the positive experience of Peru's neighbor Chile emphasizes the importance of the concurrent availability of

agricultural credit, fair market prices, access to inputs and an efficient marketing system. Without these, progress is slow or non-existent (Pontificia Universidad Catholica de Chile, 1985).

With a mean of above 3.8, it was indicated that the level of management skills on behalf of the producers was considered to be somewhat of a limitation. More specific data in this area were previously reported in regards to the perceived level of management efficiency of different types of agricultural production units. Also considered to be somewhat of a limitation was available storage for agricultural products. It would seem that this limitation is directly related to the lack of markets and transportation to the marketplace which may result in the need for the storage of agricultural products. The availability of technical agricultural extension services as a limitation to agricultural production was ranked lower than anticipated with a mean of 3.81. This lower ranking may indicate that, while the lack of extension services is a limitation, there are many other more critical limitations.

An additional question asked the respondents to rank the top three most serious limitations from the sixteen items. In accordance with the previous findings, governmental policies towards agriculture was considered to be the most serious limitation with low agricultural prices as the second most serious limitation. These priorities are shared by Larios (1987). The third most serious limitation varied somewhat but by less than 1 percent. Available markets for agricultural products was

selected as the third most critical limitation by 13.7% of the respondents while 13% chose the impact of terrorism in the rural areas.

Comparison of Perceptions with Selected Demographic Variables

To further develop an understanding of the agricultural extension system in Peru, perceptions of the respondents were compared with the demographic data of the individuals and of the institutions. Using the oneway analysis of variance program with composite scores and selected demographic data, the items reported in this section were found to be significant at the .05 level.

When focusing on the definition of the institutions (private, public or international), it was found that the respondents which were working with institutions in the public and private sectors perceived the extent to which agricultural extension services were actually received by different production units as significantly different than did their counterparts working with international institutions. The respondents working in the public and private sectors perceived the agricultural units as actually receiving significantly more extension services than did the respondents working with institutions which were members of an international organization. This finding may be due to increased knowledge of agricultural extension systems on the part of the respondents from the international institutions. Respondents who identified their institutions

as being a member of an international organization were more likely to have lived and worked internationally than their counterparts in the public and private sectors. As a consequence, there is a likelihood the respondents from the international institutions will have a greater knowledge of different extension systems and the level of extension service in other countries. It is suggested that this increased knowledge influenced the perceptions between the groups in regards to the level of extension services actually received in Peru.

The number of years the institutions were active in agriculture was divided into three groups: (1) 9 years or less; (2) 10 to 19 years and , (3) 20 years or more. The type of information which should be disseminated by agricultural extension agents in Peru was perceived differently between the respondents who worked with institutions which had been active in the area of agriculture for 9 years or less and those with institutions which had been active for 20 years or more. Those respondents pertaining to institutions with 20 years or more of experience perceived information dissemination topics to be more important than did the respondents with institutions having less than 9 years of experience. It may be theorized that the philosophy of the institutions with more years of experience in agriculture placed a higher importance on the dissemination of information by agricultural extension agents. Further, it may be concluded that the relatively newer institutions may rely more on alternative dissemination techniques and place less emphasis on the dissemination of

information by extension agents than do the older institutions.

The level of education attained by the respondents proved to impact significantly on their perception of various items. The level of education attained was divided into the following four categories: (1) less than a university level education; (2) bachelors degree; (3) masters degree and, (4) doctorate degree.

When considering who should bear the cost of agricultural extension programs in Peru, the respondents differed in opinion between those respondents with the least amount of education and the other three groups. Beyond the obvious fact that the group with a significantly different perception had a much lower level of education than the respondents in the other groups, it was not possible to discern the motivation for the difference in perceptions.

The extent to which different farming units were efficient in agriculture was viewed differently between the respondents with a doctorate degree and those respondents with either a bachelors degree or no university level education. The respondents with a doctorate degree perceived the different agricultural production units to be significantly less efficient than did the other two groups. It is probable the respondents with the advanced degree had more rigid definitions of efficiency as well as a higher level of expectations from the performance of the different production units.

The extent to which different agricultural producers were seen as efficient in management varied between the respondents not holding a university degree and those respondents with a masters degree. The respondents without a university degree perceived the management of the different types of production units to be more efficient than did those respondents with a masters degree. It is theorized that the group with the higher level of education had greater knowledge of the process of management as well as a more rigid definition of efficiency. Further, as previously mentioned, it may be concluded that the respondents with a higher level of education have greater expectations from the agricultural producers.

The age differences among the respondents were found to significantly affect their perception of four of the items in the survey. The age categories of the respondents are as follows: (1) up to and including age 34; (2) age 35 to 44; (3) age 45 to 54 and, (4) 55 years of age or more. The extent to which different types of farming units actually received agricultural extension services was perceived differently between those respondents age 55 or older and the other three age groups. The older respondents perceived the different types of agricultural production units to actually receive fewer extension services than did the other respondents. This difference in perceptions may be due to the fact that the older respondents have a broader experience base on which to make their judgments and may have witnessed agricultural extension programs

in Peru when the level of service was higher than it was at the time this research study was conducted.

The extent to which the different age groups agreed with selected macro-level statements pertaining to agricultural extension in Peru was significantly different between the respondents age 55 or older and the 45 to 54 age group. The respondents age 55 and over agreed less with the policy statements than did the younger respondents.

Regarding activities pertaining to coordination between institutions, the respondents which were between 35 and 44 years of age agreed less strongly with the statements than did the respondents age 55 or older. These differences may be interpreted as the older group demonstrating stronger support of coordination activities. This strong support of coordination on the part of the older respondents may be due to their greater willingness to work together with others as well as a recognition of the need for assistance and cooperation outside of the individual institutions. Concerning the limitations to agricultural production in Peru, the respondents between ages 35 to 44 differed significantly in their perceptions with the two older groups, ages 45 to 54 and those 55 and older. The younger respondents perceived a series of items to be less of a limitation to agricultural production in Peru than did the older groups. As the youngest group of respondents (age 34 and under) did not significantly differ from the two older groups as did the 35 to 44 years old respondents, it can not be concluded that the difference in perceptions

may be explained by the differences in age.

The number of years the respondents had been working in the area of agriculture was found to have a significant impact on the perception of several of the research items. The years of work experience were grouped into the following categories: (1) 9 years or less; (2) 10 to 19 years; (3) 20 to 29 years and, (4) 30 years or more. Respondents with 30 years or more of work experience expressed stronger agreement with statements regarding who should bear the coast of agricultural extension services in Peru than did the group of respondents with 9 years or less of work experience. The more experienced respondents also perceived the limitations to agricultural extension agents as greater than did the group with 9 years of experience or less.

The respondents with 30 or more years of work experience differed from the other three groups regarding the level of agricultural extension services actually received by the various agricultural producers in Peru. The group with the most experience perceived the producers to actually receive less extension services than did the other groups. In regards to which producers should receive agricultural extension services, the respondents with 30 years of work experience or more viewed the level of services differently than did the respondents with between 10 and 19 years of work experience. The group with the lesser amount of rated the level of extension services which should be delivered significantly higher than did the respondents with 30 years of experience or more.

The number of years the respondents worked in the area of agriculture also was a factor in how respondents perceived the factors that were limitations to agricultural extension programs in Peru. The respondents with between 10 and 19 years of work experience perceived the limitations to extension programs to be significantly less than did the two groups with more years of work experience. In regards to the limitations to agricultural production in Peru, the group with 10 to 19 years of experience perceived the limitations to agricultural production to be less than did the respondents with 20 years or experience or more.

The respondents with 10 to 19 years of work experience in agriculture perceived various limitations to agricultural extension and production to be less than their older colleagues while at the same time placing greater importance on the delivery of extension services.

The younger age groups (35 to 54) and those with somewhat less work experience (10 to 19 years) perceived limitations to be less severe than did the older colleagues with more work experience. Perhaps this is due to the political and economic environment in which the younger respondents found themselves in their formative years. Both groups of respondents had a different set of experiences by which to evaluate what is a limitation.

The respondents with 30 years or more of work experience and those age 55 or more, perceived the level of extension services actually received by the different types of agricultural producers to be less than did their younger colleagues and those with less years of experience. Each group has developed a different perception of the importance of agricultural extension which influenced their opinion of the extent to which extension services should be delivered to the different agricultural producers in Peru. The respondents with 30 years of work experience or more perceived the level of extension services which should be delivered to different producers as less than the respondents with between 10 and 19 years of experience.

In summary, it may be theorized that the older respondents who have more years of work experience placed less importance on agricultural extension services as they perceived limitations to be greater, the level of services actually received to be less and the level of services which should be received as less than did at least a portion of their younger colleagues with less years of work experience. Conversely, the younger respondents with less experience placed greater importance on agricultural extension services while perceiving the limitations to extension as well as production to be less.

CHAPTER VI.

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

The main purposes of this study were to develop a comprehensive profile of the institutions which promote agricultural development in the South American country of Peru and to provide baseline data on the status of the agricultural extension system as a foundation for future related research. A secondary purpose of this study was to determine the needs and limitations of the agricultural extension system as perceived by individuals who were directly directly involved with the promotion of agricultural development in Peru. For the purposes of this study, individuals who work with institutions (i.e., the Ministry of Agriculture, agrarian universities, international development agencies, private research and extension agencies) which have the development of the of the Peruvian agricultural sector as a primary operational goal, were defined as agricultural development promoters.

Summary

Background

Over the past decades, there has been a decline in the performance of the Peruvian agricultural sector. With the national population growth at 2.5%, (World Almanac and Book of Facts, 1990), this phenomenon has contributed to the declining ratio of food per capita. Between the early

1970's and 1980, the importation of food into Peru increased by over 20% (INIAA, 1985). The poor performance of the agricultural sector in Peru and the subsequent decline in agricultural production has had a direct influence on the decreasing standard of living among the majority of Peruvians and the increasing level of malnutrition and social unrest (Morales Bermudez, 1987).

The most recent comprehensive study of the rural sector in Peru, the National Survey of Rural Homes (ENAHR), conducted between August, 1983 and July, 1984, revealed that only 3.6% of the agricultural producers received agricultural extension services during this period. The ENAHR study also revealed that only 7.5% of producers received agricultural credit during this same time frame. Further, it was demonstrated that farmers who received both agricultural extension services and credit increased their average earning over 50% for each hectare under cultivation (Ccama, 1987). The improvement of the agricultural extension system in Peru is critical to the development of the agricultural sector on a whole.

Methodology

This was a descriptive research project which utilized the survey approach. The research population for this study was comprised of individuals who worked with institutions (i.e., the Ministry of Agriculture, agrarian universities, international development agencies,

private research and extension agencies) in the Lima metropolitan area which had the development of of the Peruvian agricultural sector as a primary operational goal. These individuals are referred to as agricultural development promoters.

Due to factors beyond the control of the researcher, it was not possible to conduct the research on a national level as originally planned. Institutions which promote agricultural development in Peru and had offices in the Lima metropolitan area comprised the research population of this study. Due to the fact that the organizational structure of institutions in Peru is highly centralized, the majority of the institutions which promote agricultural development have central office the Lima metropolitan.

It was determined that a comprehensive listing of agricultural development promoters in the Lima area, either by individuals or by institutions, did not exist. It proved necessary to conduct an extensive, in-depth investigation which took approximately six months in order to identify the research population for this study. A list of institutions which were identified may be found in Appendix F. All valid institutions were included in the research population. Only those departments of each institution identified which were directly involved with promoting the development of the agricultural sector were included.

The research instrument was developed based upon the research objectives and reviewed by a select group of individuals knowledgeable in

the subject area. Two questionnaires were distributed to each of the 110 valid institutions included in the population for a total of 220 questionnaires. The number of usable questionnaires returned were 161, or 73%. The majority of the data were collected between August and October, 1990, with a limited number of questionnaires returned at a later date. Data analysis was conducted using the Statistical Package for the Social Sciences (SPSSx).

Major Findings

The following are the major findings of this study:

1. The institutions which promote agricultural development in Peru were defined as follows: 59.6% in the private sector, 26.7% in the public sector and 13% were defined as a member of an international organization.
2. Of the projects which were either in the planning stage, on-going at the time of the study or which had been completed in the previous five years, over 50% included an extension component and over 40% were conducted in coordination with at least one other institution.
3. In both management and agricultural production, agricultural development promoters perceived the corporate farms as being efficient while the minifundistas were viewed as being somewhat inefficient.

4. Agricultural development promoters perceived coordination among individuals and institutions to be important and strongly agreed extension activities should be coordinated by a cooperative effort and not solely by the Peruvian government.
5. The level of agricultural extension services provided to agricultural producers in Peru was perceived to be very low with the exception of the corporate farms.
6. The lack of financial resources was considered to be the prime limitation to agricultural extension programs and to the institutions which promote agricultural development in Peru.
7. The unsafe working conditions for field personnel due to terrorist activities in the rural areas are a strong limitation to both agricultural production and agricultural extension.
8. Governmental policy towards agriculture and low product prices are perceived to be the strongest limitations to agricultural production in Peru.

Conclusions

The objectives of the study were to provide a profile of the agricultural extension system in Peru and to assess the perceptions of the professionals involved in agricultural development. The following conclusions were based upon the major findings of this study:

1. The respondents in this study were dedicated, highly

qualified individuals.

2. The institutions represented in this study relied heavily on donations from international organizations.
3. Institutions which promote agricultural development in Peru are multifaceted organizations which have a variety of activities on-going at the same time and have a diverse client base.
4. Agricultural development promoters strongly support agricultural extension activities in Peru.
5. Agricultural development promoters consider the agricultural sector to be important to the national economy and to the national well being.
6. Although agricultural extension activities have the potential to increase agricultural production and to make a significant contribution to the national economy, this has not occur in Peru in recent years.
7. Agricultural development promoters believe that larger farms are more efficient in management and production than are farms with less acreage.
8. The level of agricultural extension services delivered to producers was based upon the ability of the farmer to pay for the services and not upon need.
9. With the possible exception of the corporate farms, agricultural extension services to farmers in Peru are not adequate.

10. A lack of financial resources is a major limitation to agricultural development in Peru.
11. Agricultural development promoters face multiple challenges in the successful completion of their work objectives.
12. Terrorism is a strong limitation to agricultural development activities.
13. Agricultural development promoters are open to the use of different information delivery strategies by agricultural extension agents.
14. Agricultural development promoters believe the role of the agricultural extension agent should be quite diverse in regards to the information which they should disseminate.
15. The agricultural policies of the Peruvian government are a major constraint to the development of the agricultural sector in Peru.
16. Transportation to the marketplace for agricultural products, access to agricultural credit by producers and an available market for agricultural products are major constraints to the development of the agricultural sector in Peru.
17. The lack of agricultural extension services is just one of many limitations to agricultural production in Peru.

Recommendations

Based upon the findings and conclusions of this research study, the following recommendations were formulated:

1. A planned effort should be undertaken to improve the level of coordination which exists among the agricultural development promoters. It is recommended that, under the guidance of an international development agency, an advisory committee be established, consisting of selected representative from the private, public and international agriculture development community. After establishing a network of communication, it is recommended that a national forum be held to establish a framework from which cooperation may be promoted. A diagram of this recommendation may be found in Figure 13.
2. Peruvian government officials and representatives of the international development community should address the primary limitations to agricultural development which were found in this study, specifically: the low market prices for agricultural products; the lack of available markets; lack of funding for extension and development programs; the unsafe working conditions in the rural areas and the macroeconomic policy of the government towards agriculture. Any attempt to further develop the agricultural sector in Peru must address these issues.

3. The receipt of extension services should be based upon need and not the ability to pay, thus increasing the level of services to the small farmers.
4. The findings of this study should be disseminated in Peru both in an academic journal and in a source more frequently read by lay people such as a popular agricultural magazine.

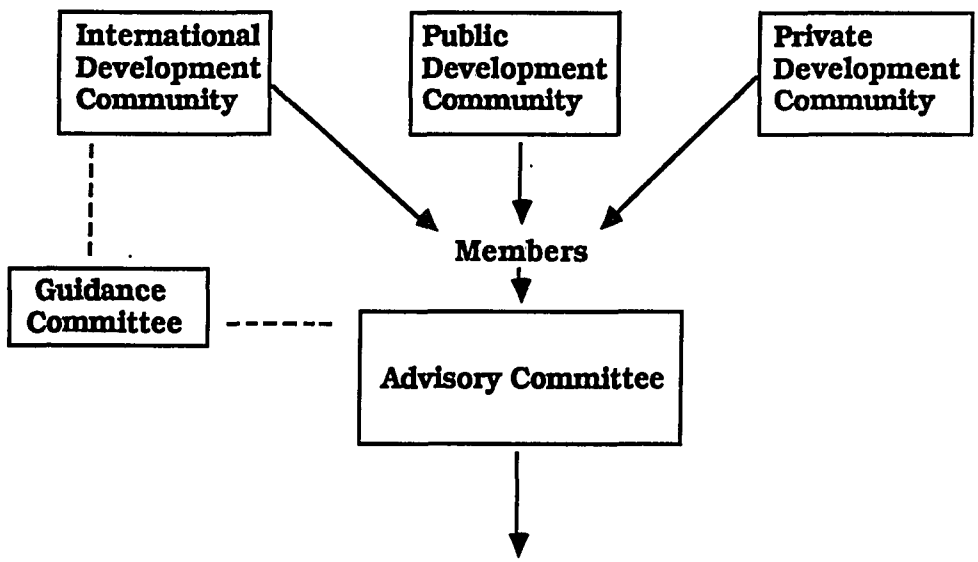


Figure 13. Recommended framework for the establishment of a network of communication among agricultural development promoters in Peru

Recommendations for Further Study

1. The data from this research should be further analyzed to reveal any findings which are beyond the scope of the objectives of this study.
2. The data from this study which provide a profile of the institutions involved in agricultural development in Peru should be utilized as the basis for future research studies in Peru.
3. Additional research similar to this study should be conducted in other Latin American countries in order to provide the framework for comparative studies.
4. If possible, this study should be replicated in Peru using agricultural producers as the research population. Results of both studies should then be compared to determine the effectiveness of agricultural extension system and to provide a basis for the improvement of agricultural extension services.

Implications to Development

This study has provided data on a variety of subject matter areas relating to agricultural development in Peru. The results of this study have indicated a strong perception on behalf of the respondents that the agricultural policies of the Peruvian government have had a detrimental effect on the agricultural sector in Peru. Specific problem areas which have been negatively impacted by the governmental policies

have been identified. Limitations to the agricultural extension system, extension agents as well as to agricultural production on a whole have also been identified. Together, this information contributes pieces to the puzzle that is agriculture in Peru. When combined with the comprehensive list of institutions which was developed in this study, the basis for informed action and change is established. It is hoped that the information which is a result of this study may serve as the catalyst for increased interaction, discussion and cooperation among the institutions and individuals working towards the common goal of agricultural development as well as the basis for further related research.

BIBLIOGRAPHY

Alberti, G. (1988). Persistence and change in structure and values in the sugar plantations of northern Peru. In J. Nash (Ed.), Popular Participation and Social Change: Cooperatives, Collectives and Nationalized Industry. (pp. 197-210). Paris, France: Mouton Publishers.

Alderson-Smith, G. (1976). Peasant response to cooperativization under agrarian reform in the communities of the Peruvian Sierra. In J. Nash (Ed.), Popular Participation and Social Change: Cooperatives, Collectives and Nationalized Industry. (pp. 113-155). Paris, France: Mouton Publishers.

Andean Report (1990). Asparagus spearheads agro-export push. The Andean Report, XIX(1), 11-12.

Astelarra, J. (1975). Land Reform in Chile during Allende's Government. Latin American Studies Program Dissertation Series, No. 64. Cornell University, Ithaca, New York.

Babbie, E. (1986). The Practice of Social Research. Belmont, California: Wadsworth Publishing Co.

Baker, H. (1989). Extension's linkages with community development. In Donald Blackburn (Ed.), Foundations and Changing Practices in Extension (pp. 47-57). Canada: University of Guelph.

Banco Central de Reserva del Peru. (1986). Memories. Lima, Peru: Banco Central de Reserva del Peru.

Banco Continental. (1989). Report on the Economic Situation of Peru: Quarterly Report. (Second Quarter). Lima, Peru: Banco Continental.

Boone, E. (1989). Philosophical foundations of extension. In Donald Blackburn (Ed.), Foundations and Changing Practices in Extension (pp. 1-9). Canada: University of Guelph.

Bourque, S. and Warren, K. (1989). Democracy without peace: the cultural politics of terror in Peru. Latin American Research Review, XXIV(1), 7-34.

Bryant, C. and White, L.G. (1982). Managing Development in the Third World. Boulder, Colorado: Westview Press.

Caballero, J.M. (1984). Agricultura peruana y campesinado: balance de la investigación y reciente y patrón de evoluación. Apuntes, 14, 3-78.

Caceda Diaz, F. (1987). Problemas Agrarios, Primera Parte. Puno, Peru: Escuela de Postgraduados UNA Puno.

Caceda Diaz, F. (1988). Problemas Agrarios, Segunda Parte. Puno, Peru: Escuela de Postgraduados UNA Puno.

Castañada, V. M. (1986). The Role of Post-secondary Agricultural Education in the Socioeconomic Growth of Peruvian Agriculture. Giessen: Zentrum fur regionale Entwicklungsforschung.

Cava Castillo, E. (1979). La Extension Agricola en el Peru: Pasado, Presente y Futuro. Chiclayo, Peru: Ministerio de Agricultura y Alimentación, Centro de Investigación Agropecuaria del Norte.

Ccama, F. (1987). El uso del credito y la asistencia tecnica. In Javier Portocarrero Maisch (Ed.), Los Hogares Rurales en el Peru (pp. 207-244). Lima, Peru: Fundación Friedrich Ebert.

Cevallos, M. (1989). Communicación Agrícola. Lima, Peru: Editorial Agraria La Molina.

Cleaves, P., and Scurrah, M. (1980). Agriculture, Bureaucracy, and Military Government in Peru. Ithaca, New York: Cornell University Press.

The Countries of the World and Their Leaders Yearbook, Vol. 2. (1991). Bair, Frank (Ed.) Detroit, Michigan: Gale Research Inc.

El Comerico. (March 3, 1990). "Aunemto poberza critica". El Comerico, Lima, Peru.

El Comerico. (Feburaray 25, 1990). "El shock ya lo estamos viviendo". Lima, Peru: El Comerico.

El Comerico. (March 28, 1990). "Sin Estudiar primera se quedan 161,200 menores". Lima, Peru: El Comerico.

El Comercio. (July25, 1989). "Despues de 20 años, la agricultura tiene que elevar su productividad". Lima, Peru: El Comercio.

Fernand and Salazar (1989). Lost manuiscript. Lima, Peru.

Figueroa, A. (June, 1989). Intregración de las politicas de corto y largo plazo. Economia, XII(23), 225-247.

Figueroa, A. (1987). Introducción. In Javier Portocarrero Maisch (Ed.), Los Hogares Rurales en el Peru (pp. 17-26). Lima, Peru: Fundación Friedrich Ebert.

Francis, C. A. (1985). Rationality of new technology for farmers in the tropics. Agricultual and Humans Values, II(2), 54-59.

George, S. (1977). How the Other Half Dies: The Real Reasons for World Hunger. Otowa, New Jersey: Rowman and Allanheld.

Gilbert, D. I. (1977). The Oligarchy and the Old Regime in Peru. Latin American Studies Program Dissertation Series, Cornell University, Ithaca, New York.

Hopkins, R. (1986). Agricultura, Politica Agraria y Administración Publica. Lima, Peru: Escuela de Administración de Negocios.

Hopkins, R. (1987). La Producción agricola. In Javier Portocarrero Maisch (Ed.), Los Hogares Rurales en el Peru (pp. 247-270). Lima, Peru: Fundación Friedrich Ebert.

Hurtado Miller, J.C. (1986). Por Una Causa Agraria. Lima, Peru: Universidad del Pacifico.

INIAA (1985). Agricultural Research and Extension Review. Unpublished report.

International Sevice for Agricultural Research. (July, 1985). Unpublished report: INIPA's response to Peru's need for agricultural research and extension. Unpublished report to the Government of Peru, Ministry of Agriculture and National Institute for Agrarian Reform. The Hague, Netherlands: ISNAR.

Jaquette, J. S. (1971). The Politics of Development in Peru. Latin American Studies Program Dissertation Series, Cornell University, Ithaca, New York.

Kay, C. (1982). Achievements and contradictions of the Peruvian agrarian reform. The Journal of Development Studies, 18, 141-170.

Lagos, M., and Morgan, M. (1983). Agroalimentación y Agroindustria. Lima, Peru: Friedrich Ebert Foundation.

Lajo Lazo, M. (1988). Los insumos agrícolas importados y el estancamiento de la agricultura andina. Comercio Exterior, 38(7), 586-592.

Larios, J. F. (1989). Impacto de la Politica Camaiaria Sobre el Sector Agrario en el Peru. Diagnostico Debate, 43, Lima, Peru: Fundación Friedrich Ebert.

Leedy, P. (1985). Practical Research: Planning and Design. New York, New York: Macmillan Publishing Co.

The Los Angles Times. (May 22, 1990). "Drugs, Terror - A Union in Blood". Los Angles, California: The Los Angles Times.

The Los Angles Times. (November 29, 1990). "Amnesty International Assails Peru". Los Angles, California: The Los Angles Times.

The Los Angles Times. (June 19, 1990). "What the Winner Won: A Peru in Political, Economic Shambles. Los Angles, California: The Los Angles Times.

McClintock, C., Podesiá, B., and Scurrah, M. (1984). Latin American promises and failures. In Bernhard Wilpert and Arndt Sorge (Eds.), International Yearbook of Organizational Democracy, Vol. II (pp. 443-471). New York, New York: John Wiley and Sons, ltd.

Mitchell, R.J. (1985). The roots of appropriate technology. In Gigi M. Berardi (ed.), World Food, Population and Development (pp. 328-333), Totowa, New Jersey: Rowman & Allanhead.

Mosely, P. (1985). Achievments and contradicitions of the Peruvian agrarian reform. The Journal of Development Studies, 21(3), 440-448.

Nunez Nunez, D. (1988). La Communicación como Estrategia para la Communición. Memoria de la mesa redona internaciónal sobre politicas y estrategias de generación y difusión de innovaciones para el desarrollo agrícola y rural en America Latina, Santiago, Chile, 8-12 de Agosts, 1988. Food and Agriculture Organization (FAO).

Paz Silva, L. J. (1986). Peru and the CIGAR Centers: a study of their collobration in agricultural research. Unpublished report, the World Bank. Washington, D.C.: World Bank.

Pomareda Benel, C. (1985). Invesitgación y extensión agropecuaria en el Peru: ¿como y porque? Notas Agroeconomicas del INIPA, 18(85), 1-19.

Pontificia Universidad Catholica de Chile (1985). Transferencia de technologia para la agricultura Chilena. Publicación del Departamento Economia Agraria, 41.

Rice, E. B. (1974). Extension in the Andes. Cambridge, Massachusetts: MIT Press.

Rivera, W. (Unknown). Agricultural extension worldwide: socio-political, organizational and programmatic characteristics. Unpublished paper, University of Maryland, Center for International Extension Development, College Park.

Rivera, W., Seepersad, J., and Pletsch, D. (1989). Comparative agricultural extension systems. In Donald Blackburn (Ed.), Foundations and Changing Practices in Extension (pp. 139-147). Canada: University of Guelph.

Schmidt, G.D. (1984). State, Society and Public Investment in Peru, 1958-1980. Unpublished doctoral dissertation, Cornell University, Ithaca, New York.

The Statistical Yearbook of Latin America. (1986). Santiago, Chile: Economic Commision for Latin America and the Caribbean.

Todaro, M. (1977). Economic Development in the Third World. London, England: Longmans.

Vergara, R., Figallo, F., and Aguilar, A. (1986). El Agro Hoy: temas en Debate. Lima, Peru: Centro de Estudios y Promoción del Desarrollo.

Webb, R. and Lamas, T. (1987). Aspectos metodologicos y macroeconomicos. In Javier Portocarrero Maisch (Ed.), Los Hogares Rurales en el Peru (pp. 29-123). Lima, Peru: Fundación Friedrich Ebert.

World Almanac and Book of Facts (1990). New York, New York: St. Martins Press.

ACKNOWLEDGEMENTS

My deepest appreciation to Dr. Robert Martin for his patience and understanding with the intricacies of this study and for his support throughout my graduate program. My sincere appreciation to Dr. Wade Miller, Dr. Michael Whiteford and Dr. Sally Williams for their valuable advice and support. My heartfelt thanks to Dr. Harold Crawford for his tireless support, encouragement and for the many opportunities which he has given me over the past years.

This study would not have been possible without the never ending patience, encouragement and support of my parents, Hank and Shirley Brown, and without my sister, Debra, being there to humor me through the difficult times. My thanks to the three of them for keeping me on track and encouraging me to follow my dreams. I would like to dedicate this study to the memory of my grandparents, Viola and Charles Cox, for their unwavering faith in me and to Opal and Sim Brown, for passing on to me their love of agriculture.

Finally, my appreciation to Mario, Deisa, Mariella, Ada, Javier, Carlos Tejada and the many people at ESAN who assisted with this study. My gratitude to Dr. James Leising, Dr. Orville Thompson and Dr. Mari Golub of U. C. Davis for their years of encouragement and for believing in me. My thanks to Elio Esqueda for his valuable advice and assistance and to the entire international agriculture program staff at Iowa State for their friendship.

APPENDIX A. QUESTIONNAIRE AND COVER LETTER IN ENGLISH

Dear colleague: August, 1990

Those of us that are interested in the development of the agricultural sector in Peru recognize the importance of agricultural extension education services to agricultural producers and the need for coordination between organizations and institutions that work in this this area. In this theme, we are conducting a research study of the opinions and perceptions of individuals who are involved in promoting the development of the agricultural sector in Peru in order to analyze the actual situation of the agricultural extension system.

This study is being conducted by a visiting researcher to ESAN (the Graduate School of Business Administration) under a contract agreement between ESAN, the Academy for Educational Development (AED) and the United States Agency for International Development (USAID). The results of this study will be made available throughout Peru and will serve as the basis for a doctoral study at Iowa State University in the United States. If you wish to receive the results of this study, indicate your desire to do so in the space provided at the end of the questionnaire and we will send them to you at the first possible opportunity. We are sure that the results will be very useful.

Your participation in this study is of great interest to us. Please take a few minutes and assist us in this effort. Your opinion is very important to this study and will help those of us involved in agricultural development in Peru to better understand the environment in which agricultural extension operates, and how to improvement it in the future. Enclosed are two questionnaires that are exactly the same; please answer one yourself and pass the other questionnaire on to a colleague who works with you in the area of agricultural extension and/or agricultural development. If you wish, you may pass both questionnaires to such colleagues. It is not necessary to put your names on the questionnaires as we are interested only in a statistical analysis of the responses. All of your answers will be held in the strictest confidence.

A research assistant will be arriving at your office in <u>five days</u> to pick up the completed questionnaires. If you or your colleague(s) do not wish to answer the questionnaire, <u>please return the blank questionnaires</u>.

Again, we ask that you take a few minutes to answer the questionnaires as soon as possible. Thank you for your cooperation.

Sincerely,

Rebecca Brown Mejia
Visiting Researcher and Advisor
AED/AID/ESAN

Carlos Tejada
Director, Research Department
ESAN

Part 1: Please answer the following questions using the rating scale of 5 to 1 with 5 being the maximum response and 1 the minimum. Please take note of the different rating scale descriptors among several of the questions.

Example:
When considering factors that limit public transportation in Lima, how important are the following:

	very important				not important
a. state operated transportation units	5	4	3	2	1
b. privately owned and operated transportation units	5	4	3	2	1
c. vehicle maintenance	5	4	3	2	1
d. rationing of electricity	5	4	3	2	1

---

1. The cost of agricultural extension services should be...

	strongly agree				strongly disagree
a. paid 100% by the client	5	4	3	2	1
b. provided 100% by the government	5	4	3	2	1
c. financed by a coordinated effort between the government, universities, private and international business organization	5	4	3	2	1
d. paid by the agricultural producer according to his/her capabilities and subsidized by the Peruvian government	5	4	3	2	1
e. other_____	5	4	3	2	1

2. To what extent do the following resources impede the agricultural extension agent from completing his/her work:

	strongly agree				strongly disagree
a. transportation (vehicles)	5	4	3	2	1
b. fuel availability	5	4	3	2	1
c. office materials	5	4	3	2	1

	strongly agree				strongly disagree
d. communication infrastructure (i.e. telephones, fax machines)	5	4	3	2	1
e. access to new information and technology	5	4	3	2	1
f. other_____	5	4	3	2	1

3. To what extent are the following farming units efficient in agricultural production:

	very efficient				not efficient
a. minifundista (0 to 3 has.)	5	4	3	2	1
b. small (4-10 has.)	5	4	3	2	1
c. medium (11 to 20 has.)	5	4	3	2	1
d. large (more than 21 has. individually owned)	5	4	3	2	1
e. cooperatives (CAPS, SAIS)	5	4	3	2	1
f. corporate farms	5	4	3	2	1

4. To what extent do the following agricultural production units actually receive agricultural extension services:

	extensive services				no services
a. minifundista (0 to 3 has.)	5	4	3	2	1
b. small (4-10 has.)	5	4	3	2	1
c. medium (11 to 20 has.)	5	4	3	2	1
d. large (more than 21 has. individually owned)	5	4	3	2	1
e. cooperatives (CAPS, SAIS)	5	4	3	2	1
f. corporate farms	5	4	3	2	1

5. To what extent are the following agricultural production units efficient in management:

	very efficient				not efficient
a. minifundista (0 to 3 has.)	5	4	3	2	1
b. small (4-10 has.)	5	4	3	2	1
c. medium (11 to 20 has.)	5	4	3	2	1
d. large (more than 21 has. individually owned)	5	4	3	2	1
e. cooperative (CAPS, SAIS)	5	4	3	2	1
f. corporate farms	5	4	3	2	1

6. To what extent do the should following agricultural production units receive agricultural extension services:

	extensive services				no services
a. minifundista (0 to 3 ha.)	5	4	3	2	1
b. small (4-10 ha.)	5	4	3	2	1
c. medium (11 to 20 ha.)	5	4	3	2	1
d. large (more than 21 ha. individually owned)	5	4	3	2	1
e. cooperative (CAPS, SAIS)	5	4	3	2	1
f. corporate farms	5	4	3	2	1

7. To what extent do you believe...

	strongly agree				strongly disagree
a. agricultural extension services are adequate in Peru	5	4	3	2	1
b. in theory, agricultural extension services increase agricultural production	5	4	3	2	1
c. the focus of agricultural production should be for national consumption	5	4	3	2	1
d. in reality, agricultural extension services in Peru increase agricultural production	5	4	3	2	1

	strongly agree				strongly disagree
e. improving agricultural extension services should be a priority of future governments	5	4	3	2	1
f. the development of the agricultural sector is necessary to solve the economic crisis	5	4	3	2	1
g. the focus of agricultural production should be for exportation	5	4	3	2	1

8. Regarding the level of coordination that exists between groups that promote agricultural development, to what extent do you agree...

	strongly agree				strongly disagree
a. you personally are well informed of projects undertaken by institutions or departments similar to yours	5	4	3	2	1
b. there should be one main center for the coordination of agricultural extension service programs	5	4	3	2	1
c. increased coordination of agricultural extension programs would result in improved services to agricultural producers	5	4	3	2	1
d. you could improve your work if you coordinated activities with institutions or departments similar to yours	5	4	3	2	1

9. The coordination and implementation of agricultural extension programs should be the responsibility of:

	strongly agree				strongly disagree
a. exclusively by governmental institutions	5	4	3	2	1
b. independently by those who have an interest and the necessary resources	5	4	3	2	1
c. jointly by the government, universities, non-governmental organizations and the private sector	5	4	3	2	1
d. other_____	5	4	3	2	1

10. To what extent do you agree the following factors are <u>obstacles to your organization</u> in achieving its' objectives in the area of agriculture:

(circle N/A if not applicable)	a severe obstacle				not an obstacle	
a. financial resources	5	4	3	2	1	N/A
b. infrastructure	5	4	3	2	1	N/A
c. qualified managers and administrators	5	4	3	2	1	N/A
d. qualified technical staff	5	4	3	2	1	N/A
e. access to clients	5	4	3	2	1	N/A
f. cooperation from governmental institutions	5	4	3	2	1	N/A
g. other_____	5	4	3	2	1	

11. To what extent should the following <u>information dissemination methods</u> should be used by agricultural extension agents:

	strongly agree				strongly disagree
a. visits to individual farms	5	4	3	2	1
b. group meetings at extension offices	5	4	3	2	1
c. distance education (i.e. radio, television)	5	4	3	2	1
d. non-formal education programs (i.e. workshops, seminars)	5	4	3	2	1
e. demonstration farms	5	4	3	2	1
f. other_____	5	4	3	2	1

12. In order to be qualified, to what extent do you agree agricultural extension agents require:

	strongly agree				strongly disagree
a. a university degree in agriculture	5	4	3	2	1
b. non-university technical training in agriculture	5	4	3	2	1

	strongly agree				strongly disagree
c. no formal training but have work experience in agriculture	5	4	3	2	1
d. other_____	5	4	3	2	1

13. To what extent can the following factors be considered <u>limitations to agricultural extension programs</u>:

	important limitation				not a limitation
a. coordination among extension agencies	5	4	3	2	1
b. qualified technical personnel	5	4	3	2	1
c. availability of financial support	5	4	3	2	1
d. acceptance of agricultural extension services on behalf of the producers	5	4	3	2	1
e. qualified management personnel	5	4	3	2	1
f. unsafe working conditions for personnel working in the rural areas	5	4	3	2	1
g. other_____	5	4	3	2	1

14. Is it the role of agricultural extension agents to disseminate the following information:

	very important				not important
a. sources of agricultural credit	5	4	3	2	1
b. access to new markets	5	4	3	2	1
c. basic management skills (i.e. inventories, accounting)	5	4	3	2	1
d. market prices of agricultural products	5	4	3	2	1
e. proper usage of agricultural chemicals (i.e. herbicides, insecticides)	5	4	3	2	1
f. proper usage of new agricultural technology (i.e., seeds, fertilizers, machinery)	5	4	3	2	1

	very important				not important
g. natural resource conservation measures	5	4	3	2	1
h. other_____	5	4	3	2	1

15. To what extent can the following factors be considered limitations to agricultural production:

	important limitation				not a limitation
a. technical agricultural extension services	5	4	3	2	1
b. prices for agricultural products	5	4	3	2	1
c. available markets for agricultural products	5	4	3	2	1
d. transportation for agricultural products	5	4	3	2	1
e. access to agricultural inputs	5	4	3	2	1
f. access to agricultural credit	5	4	3	2	1
g. level of agricultural mechanization	5	4	3	2	1
h. availability of agricultural workers	5	4	3	2	1
i. availability of arable land	5	4	3	2	1
j. available storage for agricultural products	5	4	3	2	1
k. impact of terrorism in the rural areas on agricultural production	5	4	3	2	1
l. the parcelation of agricultural cooperative land holdings (CAPS, SAIS)	5	4	3	2	1
m. the level of formal education of the agricultural producers	5	4	3	2	1
n. the level of management skills of the agricultural producers	5	4	3	2	1
o. acceptance of new agricultural technology	5	4	3	2	1
p. governmental agricultural policies	5	4	3	2	1
q. other_____	5	4	3	2	1

Part 2: In regards to the factors that limit agricultural production (see question #15), answer the following questions.

1. Which do you believe are the three most serious problems? Answer in order of importance, placing the appropriate letter by your ranking.

   First_____ Second_____ Third_____

2. How could these top three problems be solved (answer in corresponding order).

   First_____

   _____

   Second_____

   _____

   Third_____

   _____

Part 3: Please answer the following questions. In regards to the agricultural projects in which your institution or department is involved...

1. How many projects in the area of agricultural are in the planning or proposal stage at this time? _____
2. How many projects in the area of agricultural have been undertaken in the last five years including those which are in progress at this time?____
3. How many of the projects in questions 1 and 2 (above) include agricultural extension? _____
4. How many of the projects in questions 1 and 2 (above) include coordination with other organizations that promote the agricultural?____
5. In regards to the projects in questions 1 and 2 (above), where are they located in Peru and what are their project names/description: (please use an additional page if necessary)

a. location_____ valley_____

project name/description_____

_____

b. location_____ valley_____

project name/description_____

_____

c. location_____ valley_____

project name/description_____

_____

d. location_____ valley_____

project name/description_____

_____

e. location_____ valley_____

project name/description_____

_____

Part 4: Please answer the following questions (write N/A if the question does not apply to you.)

1. How would you best define the institution where you work? (mark only one answer)
   _____private (belonging to the private sector)
   _____public (belonging to the public sector
   _____international (associated with an international organization)

2. What is the principle objective of your institution? (mark only one answer)
   _____research
   _____education
   _____administration
   _____coordination

3. What are the sources of funds for the institution or department where you work? (Please indicate those which apply to you and their percentages)
   ____% funds from the Peruvian government
   ____% funds generated from services to clients
   ____% funds donated from non-governmental organizations
   ____% funds from international sources
   ____% funds from public Peruvian Banks
   ____% private funds
   ____% other_____

4. In regards to the funds received by the institution or the department where you work:
   ____% are donations/grants
   ____% are loans
   ____% are generated by services to clients
   ____% other_____

5. What percentage of time does the institution or department where you work dedicate to the following areas:
   ____% research
   ____% teaching
   ____% technical assistance to individual agricultural producers
   ____% technical assistance to agricultural cooperatives (CAPS, SAIS)
   ____% project administration
   ____% product or service promotion
   ____% other_____

6. The work of the institution or department where you work is directed towards: (check all that apply)
   ____ minifundista (0-3 has.)
   ____ small producers (4 to 10 has.)
   ____ medium producers (11 a 20 has.)
   ____ large agricultural producers (21 or more has.)
   ____ landless agricultural producers
   ____ cooperatives including SAIS, CAPS
   ____ food processing organizations (i.e. millers and canners)
   ____ food distributors or transporters
   ____ educational and research institutions
   ____ banks and other financial institutions
   ____ non-governmental institutions
   ____ other_____

7. How many years has the institution or department where you are employed been active in the agricultural area? _____(years)

8. How many people at the institution or department where you are employed work in the agricultural area?_____

9. What is your work title/position? (if more than 1 apply, please include the different percentages that correspond to your position)
   _____% project manager
   _____% administrator
   _____% technical assistant
   _____% researcher
   _____% teacher
   _____% advisor
   _____% other_____

10. What is your highest level of education attained?
    _____high school
    _____technical study
    _____bachelors degree
    _____masters degree
    _____doctorate
    _____other_____

11. Area of specialization for your highest degree earned?_____

12. Country in which your last degree was earned?_____

13. What is your age? _____(years)

14. What is your gender? ____M ____F

15. What is your nationality? _____Peruvian _____other_____

16. How many years of experience do you have working in the area of agricultural development?_____ (years)

If you wish to receive the findings of this study, indicate the name and address where you would like them to be sent:

Name_____ Position_____

Address_____

Thank you very much for your cooperation!

APPENDIX B. QUESTIONNAIRE AND COVER LETTER IN SPANISH

esan
escuela de administración de negocios para graduados

Lima, Agosto de 1990

Estimados colegas:

Todos los que estamos interesados en el desarrollo del sector agrario en el Perú, reconocemos la importancia de los servicios de extensión agrícola hacia los productores agrícolas y la necesidad de coordinación entre las organizaciones e instituciones que los apoyan. En este ámbito, estamos realizando un estudio de opiniones y percepciones de aquellos que dirigen o están involucrados en la promoción del desarrollo del sector agrícola a nivel nacional, para analizar la situación actual en que se encuentra el sistema de extensión agrícola.

Este estudio lo está realizando una investigadora visitante de ESAN (Escuela de Administracion de Negocios para Graduados), bajo el convenio entre ESAN, la Academia para el Desarrollo Educativo (AED) y la Agencia para el Desarrollo Internacional del Gobierno de los Estados Unidos (USAID). Los resultados de este estudio serán difundidos a nivel nacional en el Perú y constituirá la base de un estudio a nivel doctoral en la Universidad Estatal de Iowa en los Estados Unidos. Si usted desea los resultados, señálelo en el espacio indicado en el cuestionario y los enviaremos a su institución lo más pronto posible. Estamos seguros que los resultados les serán muy útiles.

Su participación en este estudio nos es de sumo interés. Por favor, tómese unos minutos y coopere con nosotros. Su opinión es de gran importancia para este estudio y ayudará a todos los que estemos involucrados en el desarrollo del sector agrícola en el Perú a entender mejor el entorno en que se lleva a cabo la extension agrícola y cómo mejorarlo en el futuro. Adjuntamos dos cuestionarios iguales; por favor responda uno usted y haga llegar el otro a otra persona que trabaje con usted en el área agrícola. Si usted desea, puede pasar los dos cuestionarios a las personas indicadas. No es necesario poner sus nombres en los cuestionarios, sólo estamos interesados en el punto de vista estadístico y sus respuestas serán confidenciales.

Un asistente de la investigadora estará llegando a su oficina **en una semana** para recoger los cuestionarios. Si usted o su colega(s) no desean contestar el cuestionario, por favor devuélvalo(s) en blanco.

Nuevamente solicitamos a usted disponga unos minutos para contestar este cuestionario lo más pronto posible. Gracias por su cooperación.

Atentamente,

Rebecca Brown-Mejia
Rebecca Brown-Mejia
Investigadora Visitante
AED/AID/ESAN

Carlos Tejada Oshiro
Director de Investigación
ESAN

Nota: Cualquier consulta llamar a teléfono 35-17-60 anexo 325.

Alonso de Molina 1698 - Monterrico Chico. Telf. 351760 - Casilla Postal 1846 - Lima 100 - Perú
Fax (51-14) 360140 y (51-14) 364067

Parte 1 Conteste las siguientes preguntas, de acuerdo a su opinión, marcando según la escala de 1 a 5, siendo 5 lo máximo y 1 lo mínimo. Por favor note la diferente descripción de las escalas entre las varias preguntas.

Ejemplo: En relación a los factores que limitan el transporte público en el Perú, ¿en qué medida son importantes los siguientes?:

	muy importante				**no es importante**
a. unidades de transporte del Estado	5	4	3	2	1
b. unidades de transporte privadas	5	4	3	2	1
c. el mantenimiento de los vehículos	5	4	3	2	1
d. disponibilidad de combustible	5	4	3	2	1

---

1. El costo de servicios de extensión agrícola debe ser. . .

	completamente de acuerdo				**completamente en desacuerdo**
a. pagado 100% por el cliente	5	4	3	2	1
b. otorgado 100% por el gobierno	5	4	3	2	1
c. financiado por un esfuerzo coordinado del gobierno, universidades, empresas y organizaciones privadas e internacionales	5	4	3	2	1
d. pagado por el cliente según su capacidad de pago y subsidiado con fondos del gobierno del Perú	5	4	3	2	1
e. otro_____	5	4	3	2	1

2. ¿En qué medida los siguientes recursos impiden al extensionista agrícola cumplir con su labor?:

	muy importante				**no es importante**
a. transporte (vehículos)	5	4	3	2	1
b. disponibilidad de combustible	5	4	3	2	1
c. materiales de oficina	5	4	3	2	1
d. infraestructura de comunicación (máquinas de fax, teléfono, etc.)	5	4	3	2	1
e. acceso a nueva información y tecnología	5	4	3	2	1
f. otro_____	5	4	3	2	1

3. ¿En qué medida las siguientes unidades son eficientes en la producción agrícola?:

	muy eficientes				**no eficientes**
a. minifundistas (0 a 3 has.)	5	4	3	2	1
b. pequeñas (4 a 10 has.)	5	4	3	2	1
c. medianas (11 a 20 has.)	5	4	3	2	1
d. grandes unidades individuales (más de 21 has.)	5	4	3	2	1
e. empresas asociativas (CAPS, SAIS)	5	4	3	2	1
f. empresariales (producción agrícola concertada con empresas privadas)	5	4	3	2	1

4. ¿En la actualidad, en qué medida las unidades reciben servicios de extensión agrícola?:

	muchos servicios				ninguin servicio
a. minifundistas (0 a 3 has.)	5	4	3	2	1
b. pequeñas (4 a 10 has.)	5	4	3	2	1
c. medianas (11 a 20 has.)	5	4	3	2	1
d. grandes unidades individuales (más de 21 has.)	5	4	3	2	1
e. empresas asociativas (CAPS, SAIS)	5	4	3	2	1
f. empresariales (producción agrícola concertada con empresas privadas)	5	4	3	2	1

5. ¿En qué medida las siguientes unidades son eficientes en su capacidad de gestión?:

	muy eficientes				no eficientes
a. minifundistas (0 a 3 has.)	5	4	3	2	1
b. pequeñas (4 a 10 has.)	5	4	3	2	1
c. medianas (11 a 20 has.)	5	4	3	2	1
d. grandes unidades individuales (más de 21 has.)	5	4	3	2	1
e. empresas asociativas (CAPS, SAIS)	5	4	3	2	1
f. empresariales (producción agrícola concertada con empresas privadas)	5	4	3	2	1

6. ¿En qué medida las unidades deberían recibir servicios de extensión agrícola?:

	muchos servicios				ningún servicio
a. minifundistas (0 a 3 has.)	5	4	3	2	1
b. pequeñas (4 a 10 has.)	5	4	3	2	1
c. medianas (11 a 20 has.)	5	4	3	2	1
d. grandes unidades individuales (más de 21 has.)	5	4	3	2	1
e. las empresas asociativas (CAPS, SAIS)	5	4	3	2	1
f. las empresariales (producción agrícola concertada con empresas privadas)	5	4	3	2	1

7. Usted cree que. . .

	completamente de acuerdo				completamente en desacuerdo
a. los servicios de extensión agrícola son adecuados en el Perú	5	4	3	2	1
b. en teoría, los servicios de extensión agrícola aumentan la productividad agraria	5	4	3	2	1
c. el énfasis de la producción agrícola debe ser para el consumo nacional	5	4	3	2	1
d. en la realidad, en el Perú los servicios de extensión agrícola aumentan la productividad agraria	5	4	3	2	1

	completamente de acuerdo				completamente en desacuerdo
e. la mejora de los servicios de extension agrícola debe tener prioridad para los futuros gobiernos	5	4	3	2	1
f. el desarrollo del sector agrícola en el Perú es necesario para resolver la crisis económica	5	4	3	2	1
g. el énfasis de la producción agrícola debe estar puesto en la exportación	5	4	3	2	1

8. En relación a la coordinación que existe entre grupos que promueven el desarrollo agrícola, ¿en que medida. . .?

	completamente de acuerdo				completamente en desacuerdo
a usted personalmente está informado de los proyectos realizados por instituciones o dependencias similares a la suya	5	4	3	2	1
b. debe existir un centro principal de coordinación de programas de extensión agrícola	5	4	3	2	1
c. la mejor coordinación entre programas de extensión agrícola, redundará en mejores servicios a los productores	5	4	3	2	1
d. usted podría mejorar su trabajo si se pusiera en coordinación con instituciones o dependencias similares a la suya	5	4	3	2	1

9. La coordinación y ejecución de los programas de extensión agrícolas deben ser la responsabilidad de:

	completamente de acuerdo				completamente en desacuerdo
a. exclusivamente de instituciones del gobierno	5	4	3	2	1
b. de independientes según su interés y los recursos necesarios	5	4	3	2	1
c. del gobierno, las universidades, las organizaciones no gubernamentales y el sector privado en forma conjunta	5	4	3	2	1
d. otro_____	5	4	3	2	1

10. En qué medida está usted de acuerdo los siguientes factores impiden que su institución o dependencia donde trabaja cumpla con sus objetivos en el área agrícola: (marque N/A si no es aplicable a usted)

	impiden mucho				no impiden	
a. recursos financieros	5	4	3	2	1	N/A
b. infraestructura	5	4	3	2	1	N/A
c. gerentes y/o administradores calificados	5	4	3	2	1	N/A
d. asistentes técnicos calificados	5	4	3	2	1	N/A
e. acceso a los clientes	5	4	3	2	1	N/A
f. cooperación de las instituciones gubernamentales	5	4	3	2	1	N/A
g. otro _____	5	4	3	2	1	

11. ¿En qué medida los siguientes métodos de difusión de información deben ser utilizados por los agentes de extensión agrícola?:

	completamente de acuerdo				completamente en desacuerdo
a. visitas a chacras individuales	5	4	3	2	1
b. reuniones de grupos en las oficinas de extensión	5	4	3	2	1
c. educación distante (i.e. radio, televisión)	5	4	3	2	1
d. programas de educación no formales (i.e. seminarios, talleres)	5	4	3	2	1
e. chacras de demostración	5	4	3	2	1
f. otro_____	5	4	3	2	1

12. Para ser calificados, en qué medida cree usted que los agentes de extensión agrícolas requieren. . .

	completamente de acuerdo				completamente en desacuerdo
a. título universitario	5	4	3	2	1
b. capacitación técnica en agricultura a un nivel no universitario	5	4	3	2	1
c. ninguna capacitación formal pero sí tener experiencia trabajando en agricultura	5	4	3	2	1
d. otro_____	5	4	3	2	1

13. ¿En qué medida los siguentes factores pueden considerarse limitantes para los programas de extensión agrícola?:

	muy limitante				no limitante
a. coordinación entre agencias que trabajan en extensión	5	4	3	2	1
b. personal técnico calificado	5	4	3	2	1
c. disponibilidad financiera	5	4	3	2	1
d. aceptación por parte de los productores agrícolas de los servicios de extensión agrícola	5	4	3	2	1
e. personal administrativo calificado	5	4	3	2	1
f. condiciones de trabajo peligrosas para el personal que trabaja en las áreas rurales	5	4	3	2	1
g. otro_____	5	4	3	2	1

14. ¿Es la función de los agentes de extensión agrícola difundir la siguiente información?:

	completamente de acuerdo				completamente en desacuerdo
a. fuentes de crédito agrícola	5	4	3	2	1
b. asesoramiento de mercadeo	5	4	3	2	1
c. administración básica (i.e. inventario, contabilidad)	5	4	3	2	1
d. uso y manejo de químicos agrícolas (i.e. herbicidas, insecticidas)	5	4	3	2	1

	muy importante				no es importante
e. uso y manejo de nueva tecnología agrícola (i.e. semillas, fertilizantes, maquinaria)	5	4	3	2	1
f. técnicas para conservación de recursos naturales	5	4	3	2	1
g. otro_____	5	4	3	2	1

15. ¿En qué medida los siguientes factores pueden considerarse limitantes en la producción agrícola?:

	muy limitante				no limitante
a. servicios técnicos de extensión agrícola	5	4	3	2	1
b. precios bajos de los productos	5	4	3	2	1
c. disponibilidad de mecanización agrícola	5	4	3	2	1
d. medios de transporte de los productos hacia los mercados	5	4	3	2	1
e. acceso a insumos agrícolas	5	4	3	2	1
f. acceso al crédito agrícola	5	4	3	2	1
g. mercado para los productos	5	4	3	2	1
h. disponibilidad de trabajadores agrícolas	5	4	3	2	1
i. el nivel de educación formal de los productores	5	4	3	2	1
j. disponibilidad de almacenamiento para los productos	5	4	3	2	1
k. efecto del terrorismo en áreas rurales sobre la producción agrícola	5	4	3	2	1
l. la parcelación de terrenos de las empresas asociativas (i.e. CAPS, SAIS) sobre la producción agrícola	5	4	3	2	1
m. disponibilidad de tierras con potencial agrícola	5	4	3	2	1
n. el nivel de habilidad de gestión de los productores	5	4	3	2	1
o. aceptación de nueva tecnología agrícola	5	4	3	2	1
p. política agraria del gobierno	5	4	3	2	1
q. otro_____	5	4	3	2	1

Parte 2: En relación a los factores que limitan la producción agrícola (vea la pregunta #15 arriba), contesta las siguientes preguntas:

1. ¿Cuáles cree usted que son los tres problemas más serios? Contesta en orden de importancia, marcando la letra que corresponda al problema.

Primero_____ Segundo_____ Tercero_____

2. ¿Como podrían resolverse estos tres problemas? Conteste en el orden correspondiente a su respuesta anterior. (por favor escriba legiblemente)

Primero_____

_____

_____

Segundo_____

_____

_____

Tercero_____

_____

_____

Parte 3: Por favor conteste las siguentes preguntas de acuerdo a su opinión. En relación a los proyectos de en el área agrícola con los cuales su departamento donde trabaja está involucrada . . .

1. ¿Cuántos proyectos en el área agrícola tienen en la etapa de planeamiento o propuesta en este momento? _____

2. ¿Cuántos proyectos en el área agrícola han realizado ustedes en los últimos 5 años, incluyendo los que están en marcha en este momento?_____

3. ¿Cuántos de los proyectos de las preguntas 1 y 2 (arriba) incluyen extensión agrícola?_____

4. ¿En cuántos proyectos de las preguntas 1 y 2 (arriba) han trabajado en coordinación con otras organizaciones? _____

5. ¿En relación a los proyectos de las preguntas 1 y 2 (arriba), dónde están localizados y cuáles son sus nombres/descripción? (por favor utilize otra página si es necesario y escriba legible)

a. Ubicación geográfica_____ Valle(s)_____

Proyecto nombre/descripción_____

_____

b. Ubicación geográfica_____ Valle(s)_____

Proyecto_____

_____

c. Ubicación geográfica_____ Valle(s)_____

Proyecto_____

_____

d. Ubicación geográfica_____ Valle(s)_____

Proyecto_____

_____

e. Ubicación geográfica_____ Valle(s)_____

Proyecto_____

_____

Parte 4: Por favor conteste las siguentes preguntas (escriba N/A si no son aplicables a usted)

1. ¿Como se define mejor la institución donde usted trabaja? (Marque solo una respuesta)
   _____ privada (pertenece al sector privado)
   _____ estatal (pertenece al sector público)
   _____ internacional (miembro de una organización internacional)

2. ¿Cuál es el objetivo principal de su institución? (Marque solo una respuesta)
   _____ investigación
   _____ educación
   _____ administración
   _____ coordinación

3. ¿Cuáles son las fuentes de fondos para su institución, concretamente la dependencia donde usted trabaja: (marque los que son aplicables e indique su porcentaje)
   _____% fondos del gobierno del Perú
   _____% fondos generados por servicios a sus clientes
   _____% fondos de organizaciones no gubernamentales
   _____% fondos de fuentes internacionales
   _____% fondos de bancos nacionales del Perú
   _____% fondos privados
   _____% otro_____

4. Con relación a los fondos que recibe su institución, concretamente la dependencia donde usted trabaja, provienen de . . .
   _____ % donaciones
   _____ % préstamos
   _____ % servicios a sus clientes
   _____ % otro_____

5. ¿Qué porcentaje de tiempo dedica su institución, concretamente la dependencia donde usted trabaja, a las siguientes áreas?:
   _____ % investigación
   _____ % docencia
   _____ % asistencia técnica a productores agrícolas individuales
   _____ % asistencia técnica a productores agrícolas de empresas asociativas (CAPS, SAIS)
   _____ % administración de proyectos
   _____ % promoción de servicios o productos
   _____ % otro_____

6. ¿Con relación a las actividades que realiza su institución, concretamente la dependencia donde usted labora, el trabajo está dirigido a?: (marque todos los que son aplicables)
   ____ minifundistas (0 a 3 has.)
   ____ pequeños productores agrícolas (4 a 10 has.)
   ____ medianos productores agrícolas (11 a 20 has.)
   ____ grandes productores agrícolas (21 o más has.)

____ campesinos sin terrenos
____ empresas asociativas (incluyendo CAPS, SAIS)
____ procesadores de alimentos (i.e. molinaros, envasadores)
____ distribuidores o transportistas de alimentos
____ instituciones de educación e investigación
____ bancos o grupos financieros
____ organizaciones no gubernamentales
____ otro_____

7. ¿Cuántos años tiene su institución, concretamente la dependencia donde usted labora, trabajando en el área agrícola? _____(años)

8. ¿Que número de personas en su institución, concretamente la dependencia donde usted trabaja, están involucrados en el área agrícola? _____

9. ¿Qué cargo desempeña usted? (si es más de uno, por favor señale los porcentajes que corresponden a sus cargos)
____% gerente de proyectos
____% administrador
____% técnico agropecuario
____% investigador
____% maestro
____% asesor
____% otro_____

10. ¿Cuál es su grado máximo de estudio? (marque el grado más alto)
____secundaria
____estudios técnicos
____superior
____magister
____doctorado
____otro_____

11. ¿Cuál fue su área de especialización en su grado máximo de estudio?_____

12. ¿En qué país estudió usted su grado máximo de estudio?_____

13. ¿Cuál es su edad? _____(años).

14. ¿Cuál es su sexo? ____M ____F

15. ¿Cuál es su nacionalidad? ____Peruano ____otro_____

16. ¿Qué tiempo de experiencia tiene usted trabajando en el área agrícola?_____(años)

Si usted desea recibir los resultados de este estudio para su institutión o dependencia donde trabaja, indique el nombre y dirección donde desea recibirlos:

Nombre_____ Cargo_____

Dirección_____

¡Muchas gracias por su cooperación!

APPENDIX C. INFORMATION RESOURCES

Resources Utilized to Identify Sample Population

1. Estrategias para el Desarrollo de la Investigacion Agropecuario en la Costa Central y Sur del Peru. Fundacion para el Desarollo de Agricultura (FUNDEAGRO), 1989. Lima, Peru.

2. Estrategias para el Desarrollo de la Investigacion Agropecuario en la Sierra, Norte y Centro del Peru. Fundacion para el Desarollo de Agricultura (FUNDEAGRO), 1989. Lima, Peru.

3. Directorio Nacional 1988. Organizacion Nacional Agraria (ONA), 1989. Lima, Peru.

4. Register of Development Projects in Latin America. Organization for Economic Cooperation and Development (OECD), 1984. Paris, France.

5. Directory of International and Private Organizations Operating in Peru. The National Planning Institute (Instituto Nacional de Planificación). August, 1990. Lima, Peru.

APPENDIX D. QUALITATIVE DATA SUMMARY

Qualitative Data Summary

The following is a list of the solutions suggested by the respondents regarding the perceived limitations to agricultural production in Peru. The number of responses vary with each topic due to the differences in the number of responses to each question. Answers which are repetitious were not reported, nor were perceived limitations which received no suggested solutions.

1. Suggested solutions to the lack of agricultural extension services:
   a. Establish extension services at the local level which provide not only for technical assistance, but also for the improvement of management skills.
   b. Select qualified, trained extension agents.
   c. Provide extension services with an emphasis on improving the business skills of the farmers. Public funds should be allocated in such a manner that small producers can select private extension services.
   d. Better training of extension agents not only in technical areas, but also in pedagogical skills.

2. Suggested solutions to the problem of low prices for agricultural products:
   a. Reduce external competition by placing tariffs on imported agricultural products.
   b. Develop regional programs to avoid over production of products.
   c. Restrict the importation of agricultural products to those which are absolutely necessary.
   d. The establishment of a "farmers market" to reduce the profits that are earned by the middlemen, which at times may be more than the producers earn.
   e. Fair prices must be established at the macroeconomic level.
   f. Try to change the eating habits of the consumer to eat more nationally grown products and less imported products.
   g. Improve the commercialization structure for agricultural products.

3. Suggested solutions to the limitations associated with the transportation of agricultural products to the marketplace:
   a. Increase the funds allocated for road maintenance.
   b. Improve the road system and the methods of communication.
   c. In coordination with external funding sources such as the World Bank and the Interamerican Development Bank, improve the transportation infrastructure which in its present state, raises

the prices to the consumer.

d. Priority should be given to improving the transportation system from the central production locations to the markets.

4. Suggested solutions to the lack of access to agricultural inputs (fertilizers, seeds, etc.):
   a. Eliminate the monopoly of the agribusiness which control the importation and sale of agricultural inputs.
   b. Improve the road system and the level of available credit to increase accessibility of agricultural inputs.
   c. Promote the production of agricultural inputs and develop adequate storage for the inputs.

5. Suggested solutions to the limited access to agricultural credit:
   a. Credit from the National Agrarian Bank should be directed to producers with between 0 and 50 hectares.
   b. Other credit sources should be available to agricultural producers other than the National Agrarian Bank.
   c. Provide credit according to the actual production costs.
   d. Improved the system by which credit is dispersed.
   e. Facilitate the access to credit by forming producer organizations.

6. Suggested solutions to the lack of markets for agricultural products:
   a. Create new local and regional markets and promote the exportation of agricultural products.
   b. Improve information dissemination regarding markets and marketing strategies to the producers.
   c. Increase the capability of the farmers to negotiate by forming farmers cooperatives and eliminating the middleman by promoting direct purchasing of agricultural products by buyers subject to state control.
   d. There should be main storage centers organized by production area, at the same time keep the producers informed about market prices.
   e. There should be increased research into the marketing system; if there is good production, it is lost due to the lack of a market.

7. Suggested solutions to the low level of formal education on the part of the agricultural producers:
   a. The Ministry of Education should provide secondary level education to all the rural areas.
   b. Increased education in the rural areas with a curriculum that promotes technology and innovations.

8. Suggested solutions to the impact of terrorism on agricultural production:
   a. Development of a strategy that treats farmers as productive people and not as agents of the terrorists.
   b. Create job opportunities for the people.
   c. Develop the poorest zones of the country.
   d. Create solutions for the wide-spread misery which is the root of the phenomenon, especially by doing away with the subordinate position of the countryside when compared with the city.
   e. Providing security to the producer and to the marketer/distributor against terrorism and the drug traffickers.
   f. Support self-defense organizations (*rondas campesinas*) and provide them with military and logistical support.
   g. The problem should be solved militarily with a direct confrontation in the countryside.

9. Suggested solutions to the impact of parcelization of cooperative landholdings:
   a. The cooperatives need a technical team with professional extensionists based upon the system of production.
   b. The CAPS and SAIS should be the principle production units in Peru but they must be provided with a better organizational

structure to achieve the well being of all the members and users of their services.

c. Dividing the cooperatives ruins the economy of scale and results in production only for consumption.

10. Suggested solutions to the lack of available arable land:

a. Efficiently utilize the agricultural lands.

b. Based upon experiences in the Amazon jungle region, agricultural and economic development should be based upon the capacity of the soil, that is to say development should be based upon the best use for the soil, which in agricultural terms is minimal.

11. Suggested solutions to the governmental agricultural policies which were perceived to be a strong limitation:

a. Define macroeconomic policies which are more favorable to the agricultural sector.

b. Investments in transportation infrastructure, a massive diffusion of technical education in deprived zones of the country and the breaking the monopoly of the agricultural businesses.

c. The government should develop a policy which stops social groups such as businessmen and bankers from taking advantage of agricultural production and the agricultural producer.

d. Redefine the policies of the Ministry of Agriculture based upon

the different geographic regions of the country.

e. Policies should provide incentives for the exportation of agricultural products.

f. Create free zones.

g. Give priority to the agriculture sector over other sectors.

h. Determine the viewpoints and opinions of the agricultural producers to assist in policy formation.

i. The government should be conscious that the development of the country is based, in large part, on an efficient agricultural sector.

j. The government should stimulate the agricultural producer through adequate policies for: product prices, the availability of credit, the development of a comprehensive transportation plan.

k. Restrict the importation of certain products and change the consumer eating habits. Promote the exportation of both traditional and non-traditional agricultural products.

l. The solution is based upon the following basic principles: being coherent and consistent; the agricultural policies change with each new government and there is no long-term plan.

APPENDIX E. HUMAN SUBJECTS IN RESEARCH APPROVAL FORM

Checklist for Attachments and Time Schedule

The following are attached (please check):

12. ☒ Letter or written statement to subjects indicating clearly:
    a) purpose of the research
    b) the use of any identifier codes (names, #'s), how they will be used, and when they will be removed (see Item 17)
    c) an estimate of time needed for participation in the research and the place
    d) if applicable, location of the research activity
    e) how you will ensure confidentiality
    f) in a longitudinal study, note when and how you will contact subjects later
    g) participation is voluntary; nonparticipation will not affect evaluations of the subject

13. ☐ Consent form (if applicable)

14. ☐ Letter of approval for research from cooperating organizations or institutions (if applicable)

15. ☒ Data-gathering instruments

16. Anticipated dates for contact with subjects:

First Contact	Last Contact
August 21, 1990	September 21, 1990
Month / Day / Year	Month / Day / Year

17. If applicable: anticipated date that identifiers will be removed from completed survey instruments and/or audio or visual tapes will be erased:

12-15-90
Month / Day / Year

18. Signature of Departmental Executive Officer | Date | Department or Administrative Unit

David A. Dellow | 8/27/90 | Ag. Ed & Studies

19. Decision of the University Human Subjects Review Committee:

X Project Approved ___ Project Not Approved ___ No Action Required

Patricia M. Keith | 9-11-90 | P M Keith

Name of Committee Chairperson | Date | Signature of Committee Chairperson

APPENDIX F. LIST OF INSTITUTIONS WHICH PROMOTE AGRICULTURAL DEVELOPMENT IN PERU

Institutions which Promote Agricultural Development in Peru

The following is a list of institutions which have the development of the Peruvian agricultural sector, either directly or indirectly, as a primary operational goal and are located in the Lima metropolitan area. This is a listing of all institutions identified for informational purposes only. As the results of this study are based upon statistical averages and composite scores of all individuals who responded to the study, it may not be concluded that the findings are indicative of the opinions of any individual institution. Also, as the questionnaire return rate was 73%, it should be remembered that not all of the following institutions chose to participate in this study.

1. Centro de Estudios para el Desarrollo y la Participación (CEDEP)
2. Fundación para el Desarrollo Nacional (FDN)
3. Grupo de Análisis para el Desarrollo (GRADE)
4. Centro Peruano de Estudios Sociales (CEPES)
5. Centro Nacional de Productividad
6. Instituto de Estudios Peruanos
7. Revista AgroEnfoque
8. Fundación para el Desarrollo del Agro
9. Groupo de Estudios para el Desarrollo (GREDES)
10. Asociación Peruano para el Fomento de las Ciencas (FOMCIENCIAS)

11. Revista Agronoticias
12. Instituto Andino de Estudios en Población
13. Centro de Estudios para la Promoción del Desarrollo (DESCO)
14. Planificación Agrícola y Desarrollo Institutional (PADI)
15. Universidad del Pacífico
16. CICEAR, Universidad Nacional Agraria, La Molina
17. Escuela de Postgraduados, Universidad Nacional Agraria, La Molina
18. Instituto de Investigación y Desarollo de la Autogestión (INDA)
19. Programa Cooperativo de Investigaciones en Maíz (PCIM), La Molina
20. Programa de Hortalizas, Universidad Nacional Agraria, La Molina
21. Fundación para el Desarrollo Algodonero (FUNDEAL)
22. Centro de Estudios y de Desarollo Agrario del Perú (CE&DAP)
23. Centro de Investigaciones Tecnólogicas, Económicas y Sociales (CITIES)
24. Instituto de Cultura Andina (INCAA)
25. Instituto Peruano de Administración de Empresas (IPAE)
26. Instituto Nacional de Investigación Agraria y Agroindustrial (INIAA)
27. Fundeagro
28. Asociación para la Investigación y Desarrollo Rural (AIDER)
29. Centro de Investigación Sociales, Ecónomicas, Políticas y Anthropológicas (CISEPA)
30. Instituto de Apoyo Agrario
31. Comisión de Coordinación y Tecnologicía Andina (CCTA)
32. Centro de Estudios Nueva Ecónomica y Sociedad (CENES)

33. Centro de Investigación y Desarrollo Rural
34. Centro de Investigación, Educación y Desarollo
35. Centro de Investigación y Promoción Amazónica (CIPA)
36. Fundación para la Cooperación y el Desarollo (FUNCODE)
37. Instituto Peruano de Investigación y Desarrollo (IPID)
38. Servicio de Desarrollo Rural (SDR)
39. Servicios Educativos Rurales (SER)
40. Taller de Educación, Capacitación e Investigación Rural Andina
41. Organización Nacional Agraria (ONA)
42. Comité de Productores de Arroz
43. Asociación de Exportadores (ADEX)
44. Comité Nacional de Productores de Maíz y Sorgo, ONA
45. Fundación para el Desarrollo Algodonero
46. Instituto Huayana
47. FENDECAAP
48. Confederación Agropecuaria del Perú (CAP)
49. Confederación General de Campesinos del Perú (CGCP)
50. Confederación Nacional Agraria (CNA)
51. Fondo de Desarollo Agrario (FONDEAGRO)
52. Asociación Peruana de Ingenieros Agrónomos
53. Federación Nacional de Campesinos del Perú
54. Comite Nacional de Productores de Papa - ONA
55. Asociación Peruana de Horticultores

56. Fondo de Desarrollo de la Ganadería Intensiva de Carne de Vacuno
57. Farm Systems Management Service
58. Asociación Evangélica Lutherana de Ayuda para el Desarrollo Comunal (DIACONIA)
59. Instituto Tecnólogico Agrario (PROTERRA)
60. Caritas del Perú
61. Instituto de Ecología y Desarrollo Santiago Antunez de Mayolo (IEDSAM)
62. Habitat Perú XXI
63. Naturaleza, Ciencias y Tecnólogia Local para el Servicio Social
64. Taller de Promoción Andina (TADEPA)
65. Asociación de Defensa y Desarrollo de las Comunidades Andinas del Perú (ADECAP)
66. Centro para el Desarollo Regional (RAIZ)
67. Proyecto Andino de Tecnologías Campesinas
68. Centro para el Desarrollo del Indígena Amazónico (CEDIA)
69. Centro de Desarrollo Agropecuario (CEDAP)
70. Cooperación Financiera de Desarrollo (COFIDE)
71. Oficina General de Agricultura, Ministerio de Agricultura
72. Oficina de Reforma Agraria y Asentamiento Rural, Ministerio de Agricultura
73. Oficina de Agroindustria, Ministerio de Agricultura
74. Comisión Nacional de Producción (CONAPRO)
75. División de Proyectos Agroindustriales, Banco Agrario
76. Institution Nacional de Planificación (INP)

77. Division de Crédito Agrícola y Agroindustrial, Banco Agrario
78. Oficina de Producción y Concertación, Ministerio de Agricultura
79. Oficina Sectorial de Planificación Agraria
80. Programa de Investigación de Vacunos, Instituto Nacional de Investigación Agraria y Agroindustrial (INIAA)
81. Programa de Rumiantes Menores, Instituto Nacional de Investigación Agraria y Agroindustrial (INIAA)
82. Investigación Pecuaria, Instituto Nacional de Investigación Agraria y Agroindustrial (INIAA)
83. Fundación Ford
84. CARE, PERU-USA
85. Fundación Fredrich Ebert
86. Vecinos del Peru
87. Catholic Relief Services (CRS)
88. Technoserve
89. Centro Internacional Crocevia
90. Centro Canadiense de Estudio y de Cooperación Internacional (CECI)
91. Projects in Agriculture, Rural Industry, Science and Medicine, Inc. (PRISM)
92. Heifer Project International
93. Junta de Acuerdo de Cartagena
94. Food and Agriculture Organization (FAO)
95. Instituto Interamericano de Cooperación para la Agricultura (IICA)
96. North Carolina State University/MIAC/Perú - TTA
97. Asociación Latinoamericano de Institutiones Financieros de Desarrollo (ALIDE)

98. Centro Internacional de Cooperación para el Desarrollo Agrícola (CICDA)

99. Cooperación Técnica del Gobierno Suizo

100. Cooperativa Valle Grande

101. Academy for Educational Development - CTTA

102. Centro de Educación y Comunicación

103. Centro para el Desarrollo Alternativa (CENDA)

104. Centro de Investigación, Documentación, Educación, Asesoramiento y de Servicos (IDEAS)

105. Cáfe Perú

106. Usuarios Distritos de Riego del Perú

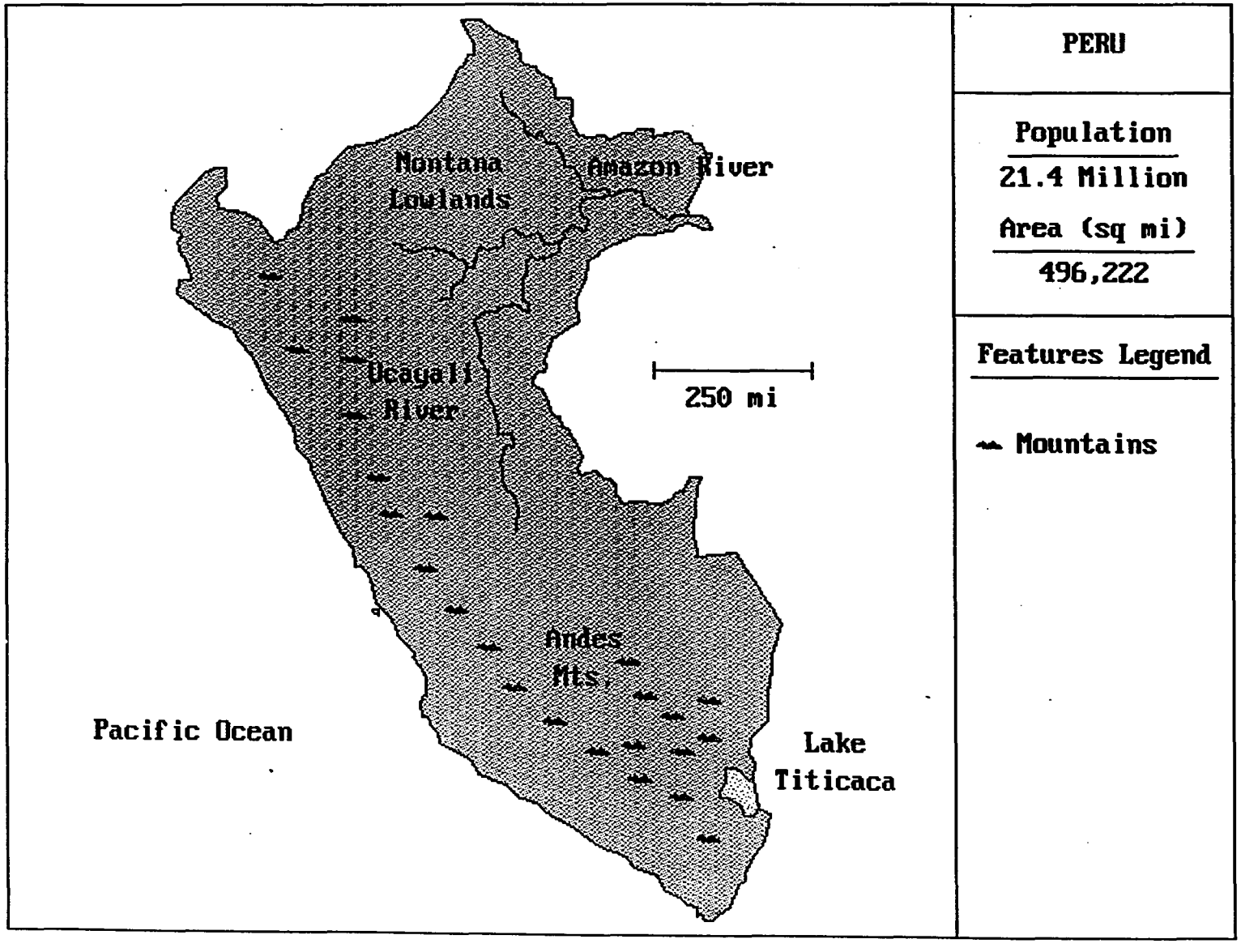
107. Servicios Agrícolas Nor-Oriente

108. Asociación para el Desarrollo (AYNI)

109. Pontífica Universidad Católica del Perú

110. Programa de Investigación de pastos y forrajes, Universidad Nacional Agraria, La Molina

APPENDIX G. MAP OF PERU



PERU

Population

21.4 Million

Area (sq mi)

496,222

Features Legend

Mountains